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" He that goes about to forward agricultural improvement must begin by finding out the true reason of what is called routine, or the ' custom of the country.' It sometimes happens that these reasons are only accidental, and then you may dismiss them fearlessly; but often it turns out that every-day practice rests on a solid foundation of facts; and then if you make an onslaught on local prejudices, they will be sure to beat you."

" The true course for the agricultural improver is, to take one step at a time, to gain a clear insight into facts by experience, not to try to go too fast, and to trust to the work of time."

" If practice which sets up to do without theory is contemptible, theory without practice is foolhardy and perfectly useless."—*From the Rural Economy of England, Scotland and Ireland,* by Leonce de Lavergne.

Journal communications should be addressed to the Editor,
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Original Articles and Reports.

I.—THE PRACTICAL BEARING UPON AGRICULTURE OF SCIENTIFIC EXPERIMENTS ON ANIMAL DISEASES, WITH ESPECIAL REFERENCE TO EPIZOOTIC ABORTION AND RED WATER.

By Prof. J. Penberthy, F.R.C.V.S.

The Application of Scientific Principles.

A quarter of a century ago, an article on "The Practical Bearing of Scientific Experiments on Agriculture" was contributed to this Journal by Dr. J. A. Voelcker; in it he dealt mainly with chemical experiments and their practical bearing on agriculture in its more limited sense of cultivation of the fields. Experiences of the period which has since elapsed would provide material for volumes of evidence of the benefits accruing from chemical research. It is, however, our intention in this article to direct attention to the effect of scientific experiments in another branch of science.

British agriculture in almost every department was at one time far in advance of that of any other country, and, notwithstanding all the adverse circumstances it has had to encounter, it still holds the lead. But if it is to maintain the position it has so long held in this respect and is to be prepared for the competition which increased productiveness elsewhere must inevitably create, it not only cannot

afford to neglect any opportunities at its disposal but must use every effort to add to them. It is to the application of the fruits of scientific experiment that Agriculture must look for its development, for if we take a broad survey, it becomes evident that in those countries in which science is most largely brought to bear on their industries, agriculture is making rapid and material advance. Though there appears to be an element in human nature which rejects the idea of being taught one's own business by those not actually practised in it, it is gratifying to observe the decay of the old prejudice which attempted to divorce from practice anything bearing the name of science—one nowadays hears much less about "a grain of practice being worth a ton of science"—and agriculturists do not now require to be convinced that very large benefits have been derived from scientific research during the past fifty years. It is now more generally realised that "Science is but revealed truth"—an accurate knowledge of facts arranged under general rules and principles; that it is not exclusively the product of the laboratory, the prerogative of so-called experimental research; nor is it the property of the so-called expert or experimenter. Though science is most materially advanced by the adoption of experimental methods, valuable truths—indeed, new truths—may be ascertained by ordinary observation, in the exercise of which the practice of agriculture becomes a series of experiments. It is the incorporation of science with agriculture, the application of its revelations to practical operations, which is really required, and with which agriculturists should be mainly concerned. It is to the advance of general education, particularly in the cultivation of the powers of observation, which must enter more largely into our national system, and a wise direction of the bias towards the probable line of life of the scholar, that we must look for establishment of that attitude of mind, or mode of thought, which will lead the practical man to trust to the results of research for assistance, to appreciate their value, and to appropriate them for his advantage.

The revelations of science know no national bonds, and even in the country in which they may be made, they will receive no special treatment unless it be in the desire and preparation for assimilating them on the part of those who would be benefited by them. The most important element is the habit of mind which favours the application of the teachings of science to the arts and industries of the people, for this must be of advantage to any nation. The scientific principles which are applied in Denmark, Germany, or Japan, are equally at the disposal of the people of other countries. Yet we stand by and see our home markets becoming more and more

occupied by foreign agricultural products, while enquiry usually reveals the fact that the foreign producer has been rendered capable of raising and sending his produce here remuneratively, *inter alia*, by taking advantage of knowledge which science has provided for him, and by attention to details, the capacity for which is cultivated by systematic education of the powers of observation and the exactitude inculcated by regard for scientific operations.

Up to the present time much of the most valuable experimental research on agricultural matters has been carried out by and at the expense of private individuals and societies. Our State has never taken agriculture with real seriousness, nor realised its duty towards an industry of such vital importance as that on which provision of the food of the people depends must be. In fact, the principle of muzzling the ox "when he treadeth out the corn" seems to have generally obtained. Increased burdens on land call for relief, but our agriculture has had to struggle on as best it could. Little has been done by the State to provide even the knowledge which might in some degree enable the agriculturist to cope with the difficulties inherent to his business, and place him in a position not less favourable for carrying it on than obtains in other countries where agriculture has received material bounties through expenditure of State funds for the encouragement of experimental research and agricultural education. There are at last some signs of awakening on the part of our people and the Government to the claims of agriculture. We appear nearer than before to a national system of agricultural education, while, if a fair proportion of the Development Fund be allocated to scientific experimental work for the improvement of agriculture, much material of practical value should be provided for our appropriation. Everyone interested in the progress of agriculture should exert his influence to secure for it what has been promised.

If it be true that the hope of the British farmer is centred in his live stock, the maintenance of its health must be an element of prime importance in agricultural economy. Certainly no system of agricultural education which fails to embrace the study of hygiene of farm animals can be complete or afford the maximum of benefit to those for whose advantage it is designed. Among the most valuable assets of the stock-owner is the health of his stock. Since that is the state which in natural selection has enabled the fittest to survive, it is that which, now under artificial selection and altered environment, it is one of his most important functions to conserve. Its conservation entails many considerations, some of which must be entered upon long prior to the animal's birth. Constitution, not

less than anatomical structure, is hereditary, and lack of health, in other words disease, may to a certain extent depend on qualities, or lack of them, derived from ancestors. Scientific research and common observation have provided much knowledge which has been a practical help in securing a larger degree of constitutional vigour, more resistance to the effect of adverse circumstances, and a greater tendency to develop in the direction which is regarded as ideal in size and form. It is, however, to the practical bearing of scientific experiment on the great assailant of health—disease, that it is proposed to briefly refer. It is not intended to attempt a review in detail of all the vast accretion to our knowledge which has been derived from experimental research during the past half century and of its effect on our live stock, but to touch lightly on some newly acquired information in relation to some of the diseases of stock at present engaging attention.

Prevention Better than Cure.

Disease and death have necessarily been among the primary considerations of mortals, and in early ages the origin of the former was as obscure as that of life is to-day. There is, therefore, little room for wonder that the messenger of death should have become associated with the spirit of evil, or darkness—personified as the devil, whose movements, entrances and exits were outside human comprehension. To prevent his in-coming was regarded beyond all human powers and higher powers were invoked by the precursors of the christian scientists to expel him, while efforts were directed to repairing the damage resulting from his visit, and the *cure* of disease " to which flesh is heir " became established as the main position. The spell of the medicine man was inseparable from the mysteries with which he surrounded his art, but with the advance of civilisation the subject of disease has naturally received much attention and elucidation, and methods of research by experiment, have within the past fifty years rendered much of its nature intelligible. The axiom, " Prevention is better than cure," is loudly proclaimed, but this is a precept are all too little observed in action, indeed, it is often little other than a figure of speech. There still lingers in the lay mind the disposition to act as if *cure* were the more important, and to regard it as the principal function of those concerned with the health of animals. It is not a little curious to observe the craving of some people for something to cure the sick, while the most simple means of prevention command but little of their

respect. To administer medicine seems to be "doing something," and the spirit of Naaman of old, who had it in him to do something great and heroic, still very largely obtains. Unfortunately, it has to be admitted that many of the serious ailments of farm stock cannot yet be controlled by medicines, but it is by no means our intention to under-estimate the value of curative medicines and surgery, or to convey the impression that progress in this direction has not been made. Recently acquired power over such diseases as "actinomycosis" and "dropping after calving," may be cited as instances of very valuable discoveries of specific cures, and much might be written to prove that scientific experiment has done much to promote the advance of curative medicine as applied to farm animals.

The discovery that contagious diseases are due to living organisms, and the demonstration of their qualities mark the most solid advance in our knowledge derived from scientific experiments, and afford the most correct and substantial grounds for dealing with their prevention or cure. But for instances of truths being ascertained by a process of common observation directed by regard for scientific principles, which have conferred immense benefits on British agriculture, we may refer to the successful eradication of Cattle Plague, Sheep Pox, Foot and Mouth Disease, etc., whose causal microbes have not yet been satisfactorily demonstrated. In the sixties of the last century Cattle Plague was costing us about £2,000,000 annually; in 1883 Foot and Mouth Disease existed in 79 counties, and nearly half a million animals were affected; in 1887 Pleuro Pneumonia existed in 70 counties. Recognition of their acutely contagious nature, and of the fact that they were all imported from abroad, led to the adoption of successful measures for their suppression, and their recurrence has since been prevented by prohibiting importation of live animals except at certain places and there only for immediate slaughter. The freedom from loss and worry enjoyed since the application of these measures, though now little appreciated, is indeed of immense economic value. We have recently had proof that, if, even by obscure means, the most virulent of these diseases should find its way into this country, it can, by exercise of the knowledge gained by previous experience, be suppressed at small cost.

It is to be feared that, when the story of original discoveries in regard to the cause, method of prevention and cure of diseases of the lower animals comes to be told, a comparatively small chapter will recount those to be credited to British scientists, whose initial work has been largely in the direction of experiments to test

whether diseases investigated abroad are related to those from which farm stock in Great Britain suffer. The organisms which respectively cause anthrax, black quarter, tuberculosis, glanders, abortion of cows, and red-water, have been discovered by foreign workers mostly in foreign countries where scientific work is appreciated by the people and encouraged by the State. Important as is the discovery and demonstration of a micro-organism proved to be the cause of disease, it must not be assumed that this is sufficient. It is, indeed, the raw material, and every new fact relating to the vital activities of the organism which can be rendered available to practice, adds real value to the discovery. In this direction the British worker may claim some credit.

Details which engage the attention of the expert are by no means essential to the carrying out of the practical measures they suggest, but there are many easily grasped facts, an appreciation of which would render the effective means of prevention more easy, and add to the interest of agricultural life. Among the main obstacles to the adoption of measures for checking and exterminating contagious disease now existent have been the initial difficulties in diagnosis or determination of its existence. Though when certain diseases are advanced, and probably their seeds sown broad-cast, it may be easy to place the finger on their subjects, in the case of such diseases as tuberculosis and glanders, the attempt was hopeless prior to the discovery of tuberculin and mallein, which could not have been thought of before the discovery and study of the virus on which each depends. With the aid of these improved means of diagnosis, and when other conditions as to funds, etc., are provided, it is not too much to say that we shall be in a position to deal radically with these costly and dangerous diseases in a way utterly impossible a quarter of a century ago.

Another direction in which scientific experiment has been brought to bear is in providing means of protective inoculation, a form of practice not generally adopted in this country, where, owing to our insular position, we have been able to use other effective means for dealing with acute contagious disease of farm animals. In South Africa, under conditions arising out of the war, many diseases became so rampant as to threaten devastation of its herds and flocks, and practically to wipe out fresh importations, but the study and adoption of methods of prevention by protective inoculation have helped to render stock-keeping possible and to provide a much more cheering prospect for agriculture. At the present time much attention is being directed to the search for means of protecting animals against tuberculosis by inoculation. Reports of

success have been received from various quarters, but so far no method appears to have fulfilled the necessary conditions. The discovery of some reliable means of rendering cattle immune would greatly facilitate the solution of the tuberculosis problem, and so confer incalculable benefit on agriculture. Time and space allow only of a superficial reference to a very small number of points indicating the practical bearing of experimental research on disease of animals. Much has been accomplished, yet stores of hidden knowledge have been little more than tapped, and what is most required is the adoption by agriculturists, of what has been acquired, together with their encouragement and co-operation. Undoubtedly a large number of our advanced agriculturists of to-day look to the teachings of science and successfully appropriate that which appeals to their judgment, but a more general regard for such matters is highly desirable. The active co-operation of stock-owners in rendering legal enactments effective is a matter of extreme importance, and, in so far as their confidence is secured by successful application of knowledge derived from experimental research, this co-operation will be acquired. There is still great obscurity associated with some diseases which, though much experimental research has been devoted to them, appear to baffle science and practice, and sometimes one may be disposed to think that the exercise of ordinary common sense might effect the purpose which is deferred while scientific experiments are in operation. A few years ago swine fever was existent in 77 counties, 5,166 outbreaks occurred and nearly 70,000 deaths were recorded, It has occurred to many that the present position would have been more satisfactory, the disease might even have been eradicated, if, at the end of 1905, when the outbreaks of Swine Fever had fallen to 817, and only 3,876 swine were slaughtered, enlightened agriculturists desirous of putting a finishing touch to this troublesome and costly pest, had demanded enforcement of the teachings of science, lent their co-operation and refused the proffered relief of an Order, which apparently made it a trifle easier to spread and maintain the disease.

In illustration of the practical bearing of scientific experiments, it is proposed to refer somewhat in detail to two diseases which at present occupy particular attention. The selection is influenced by the fact that both have been known to exist in Great Britain from time immemorial, are of general interest, and have been the subjects of recent research. It has been discovered that each is caused by a specific microbe, and, with regard to one disease, it would appear that legislative action is being considered.

EPIZOOTIC OR CONTAGIOUS ABORTION OF COWS.

The liability of pregnant animals of various species "to cast their young" has engaged the attention of stock-owners from time immemorial. If it were necessary, appeal might be made to the recorded experiences of Jacob and of Job in scriptural times to prove that it was regarded as a matter of no little importance in those early days and in support of the saying of the wise man, "there is nothing new under the sun." Coming nearer home, we may learn from his own words that old Mascall was in A.D. 1585, as we are to-day, engaged in trying to solve the problem of "how to keep cows which are great-bellied, with calf." The writings of a century ago indicate that abortion among cows had assumed such proportions as to suggest to some authorities that it was due to contagion, a position which was warmly disputed by others, who appeared to be clothed with even higher authority. Among innumerable reputed causes, sympathy, fright, smell, sight, drainage, witchcraft, ergot, lead, poisonous plants, have each had up to very recent times a large share of credit. By 1886 the disease had attracted so much attention that a question was asked in the House of Commons as to the advisability of bringing it within the operations of the Contagious Diseases (Animals) Act. Since this date, the Bath and West and Southern Counties Society and other agricultural bodies have made representations to the Board of Agriculture urging the necessity for further inquiry and, if deemed necessary and practicable, legislative action. In 1905 a Departmental Committee was appointed to enquire by means of experimental investigation and otherwise into the nature and causation of Epizootic Abortion, and to consider whether any, and if so what, preventive and remedial measures may with advantage be adopted with respect to that disease.

It is unnecessary to enlarge on the present prevalence of abortion among cows, the extent of the loss and disappointment it causes to stock-owners, or how it deranges the business of the breeder and the dairyman. In the absence of official returns or other more or less reliable data, it is not possible to compute correctly the number of cases occurring annually in Great Britain. It may not at first sight appear a matter of importance to know how many herds or animals are affected in this kingdom, but in considering the degree of danger to which our sound animals are exposed, and what legislative measures should be adopted for suppressing the disease, the cost of which will in all probability fall on the local rates, such knowledge would have had a certain value. It may be difficult

to prove that abortion is more prevalent now than twenty-five years ago, but that it is widespread enough to be of serious concern and a menace to stock-raising in Great Britain is beyond question. If one per cent. of our cows and heifers abort annually it means that 28,000 animals are affected and a much larger number exposed to the risk of infection. In the estimation of some writers on the subject, such a proportion would be altogether below the mark.

In the 1904-5 volume of this Journal, there is an article entitled "Abortion in Cows"; it is proposed now to refer mainly to points in connection with the disease which have been made clear by experimental research since that date. Therein reference was made to the fact that some experiments as to the nature of abortion had been made in Denmark, but up to that time "had not been confirmed by any English veterinarians." In 1897 Professor Bang, of the Danish Agricultural Department, published the report of his experimental work. His discovery of the microbe which proved to be the cause of Epizootic Abortion in cows in Denmark afforded the basis for determining the special characteristics of the malady and removed all doubt as to its being due to anything but contagion. This microbe has since been demonstrated to be identical with that causing Epizootic Abortion in cows in Great Britain, so that we know the same disease is common to cows in both countries. We are now in a position to appropriate what may have a practical bearing as a result of Bang's original work, and that of our Departmental Committee, etc., which has supplemented it and promises to be of much practical value.

The death of the fœtus and its consequent expulsion as an abortion are the results of a disease of the inner lining of the womb and the membrane enveloping the fœtus. This morbid condition is caused by minute bacilli which may gain entrance into the system of the pregnant cow, or heifer by different channels: (1) if injected into the blood stream; (2) if injected under the skin; (3) by passing up the vagina; (4) by the way of the mouth with food or drink. The two first-named means of access must be so rarely in operation in naturally contracted cases, that in practice their consideration cannot be regarded important. Until quite recently entrance by way of the genital opening was deemed usual, though a considerable proportion of experiments in this direction failed. The newly established fact that infection may occur through the mouth may have a very important bearing on the adoption of preventive measures.

By whatever channel the virus may enter, it is soon found almost

exclusively in the womb, so that while the mouth of the womb is closed, as it is soon after impregnation, the infected cow is not dangerous to others associated with her. A short time prior to the act of abortion, the mouth of the womb becomes open and there may be a discharge which contains the contagium. This discharge which passes out through the vagina, the abortion itself and its membranes carry the virus to the outer world, and it is by these media that the disease is spread. The discharge may continue days or weeks, the limit is not determined, but for some days at least it is known to contain infective matter.

It has been ascertained that in a moist state the virus may remain alive and effective for some months after passing from the cow. It may pass down gutters with excreta and possibly thus infect cows lower down in the shed, be flicked about by the tail, or carried by attendants, neighbours, etc. Fodder and water may thus become contaminated. Carnivorous animals, as dogs and foxes, may carry portions of the abortion to distant situations. According to the report of the Departmental Committee, bitches and vixens may contract the disease by eating the abortion, etc. It is, therefore, quite possible that in this way new centres of the disease may be established whose existence could not be accounted for otherwise. This affords an additional reason for careful watching for and the immediate destruction of the abortion, etc.

Abortion is, however, usually introduced into fresh situations by cows or heifers from infected herds. Writing in 1837, Youatt says, " When this disposition to abort first appears in a dairy, it is usually in a cow that has been purchased." Cows which have aborted, or pregnant cows or heifers already infected, though never having aborted, may bring and distribute the virus among animals in the healthy herd. Inasmuch as there is often a disposition to get rid of a cow which fails to breed, it is probably the cow which has aborted that more commonly brings the disease, though the pregnant infected animal must be regarded as equally, if not more, dangerous. In case of the former, at the time of purchase she may have no discharge, or if there is any discharge it may not contain the virus, and, if she does not abort in her new situation, it is possible no harm may result from her introduction, whereas in the case of the pregnant infected animal, it is certain that she will discharge bacilli when she aborts.

As a medium of conveyance of the virus from the cow which has aborted to the healthy cow, the bull must not be left out of consideration. There is a divergence of opinion as to the relative frequency with which abortion is spread by the bull, but if the

disease can be induced, as shown by experiment, by placing discharge in the vagina of the healthy cow, it is not possible to escape the conviction that there must be considerable risk in allowing the same bull to serve affected and healthy cows.

After the disease is introduced into a herd it spreads in no regular fashion; a few animals only, or the whole herd, may become affected. It has frequently been observed that if no new animals are brought into an aborting herd, the disease tends to die out in two or three years, sometimes less. If, however, fresh cows or heifers are introduced, the disease may remain for indefinite periods. It has also been noticed in the case of cows, which abort two or three times, that each succeeding pregnancy is of longer duration than its predecessor. Contrary to the generally accepted view, recent observations appear to indicate that there is no great tendency on the part of a cow, which has once aborted, to abort again, that is if she is not sent to the bull too soon. It is, however, beyond question that some cows abort more than once; but because a cow returns to the bull several times it must not be taken as proof of her having aborted after each service. In some cases, the first attack of the disease may have so affected the womb as to prevent conception and render the cow sterile. In connection with some contagious diseases, it is found that one attack protects from another. It appears as though, in the case of Epizootic Abortion of cows, this principle obtains, at least to some extent, and that on it depends the tendency of the disease to die out if fresh females are not introduced. If animals which have once aborted, are less susceptible than animals which have not aborted at all, it would appear wiser in attempting to eradicate the disease from a herd to keep these rather than sell them and fill their places with new animals.

The fœtus of the infected cow may be expelled at almost any period of pregnancy, perhaps most commonly between the fourth and fifth month. The experiments recorded by the Departmental Committee show that the act of abortion may occur as early as 6 weeks and as late as 36 weeks after infection, with an average of about 18 weeks. They also indicate that the virus does not remain effective in the womb long after abortion. Probably, if after three months have elapsed and disinfection has been carried out, the cow is sent to the bull, pregnancy will take place and be completed. Of course, as the virus is capable of living outside for some months after it is discharged, in an infected place a cow may possibly become re-infected, and, as we cannot measure the degree of her susceptibility, this possibility must be guarded against by the adoption of separation and disinfection. Fortunately the virus is

easily killed by heat. It does not survive after exposure for 10 minutes to a temperature of 140° F. (72° under boiling point) so that boiling water may be confidently used for disinfecting stalls.

One of the most remarkable features of this disease is its slight effect on the general health of the cow, and one of the greatest deterrents to its prevention is our inability to determine when a pregnant animal is infected. Indeed, in the great majority of instances, there is nothing distinctive until abortion has occurred. Suspicion is rarely aroused until the aborted fœtus or some discharge is discovered and the mischief spread. Return to the bull is often the first evidence observed; this more particularly refers to herds in which the malady is not known to exist. If pregnant cows are carefully watched, as they should be wherever the existence of abortion may be suspected, in some cases modified symptoms of approaching calving may be observed a short time before the act of abortion. There may be a discharge of mucous, sometimes bloodstained, swelling of the udder and vulva, dropping in of the quarters, general uneasiness, etc.

The main points of interest to stock-owners are those which deal with ridding infected herds of infection and those which deal with protecting healthy herds from introduction of the disease. The difficulty, indeed, the impossibility, with the means at present at our disposal, of ascertaining whether a cow is, or is not, infected obtain in both cases, and it is practically impossible to say at any given time which herd is free and which is infected.

As to the action to be taken to rid a herd of infection, in the first place it must be insisted on that this shall not be effected by selling infected animals, so as to expose healthy herds to infection. The disease is so prevalent that any sign or suggestion of approaching abortion should be immediately followed by isolation, or separation without stopping to consider if the abortion is contagious or sporadic. As an infected cow is probably not dangerous to her neighbours until the time of abortion, all possible attention must be paid to the first case, as by prompt action all further trouble may possibly be averted. In every case the abortion, if discovered, should, with its membranes, all discharged matter and any contaminated litter or fodder, be burned, with the aid of a little paraffin, otherwise safely buried. If the abortion is found in the field, quicklime may be applied to the contaminated surface; if in the cowshed the stall and any soiled article, etc., should be freely flushed with boiling water or some other reliable disinfectant. The cow should be isolated, if possible, by being placed in a house apart from other pregnant animals, and be not attended to by persons working with

the latter. Her tail, hind parts, indeed, all parts of the animal on which discharge from the vagina may have been deposited, should be disinfected with a 3 or 4 per cent. solution of carbolic acid. This treatment should be carried out daily so long as there is any discharge from the vagina. Tepid 2 per cent. solution of carbolic acid, or of 1 part of corrosive sublimate in 3,000 parts of water, should be injected into the vagina twice daily for three or four weeks. This procedure entails considerable trouble and expense, and it will often be found difficult to carry it out in its entirety. Three months after abortion, if the foregoing measures have been adopted, the cow may be put to the bull and, as far as possible, preserved from the risks of re-infection. If no cow is sent to the bull until these conditions are fulfilled, the chance of his becoming contaminated will be slight, but as an extra precaution it may be advisable to disinfect the sheath and under parts before and after service. In view of what has been before said as to cows which have aborted being less susceptible to the malady, it would appear probable that efforts to exterminate the disease on a farm are more likely to be effectual and economical, if such cows are retained rather than sold and new ones brought in to fill their places. If this plan be generally adopted, not only are affected herds likely to be rid of the disease in a shorter time, but the risks of infecting other clean herds will be materially reduced. Cows, which after treatment, as suggested, return to the bull time after time, are probably incapable of conception, and it will usually be most economical to fatten them for slaughter.

The inability of the owners of healthy herds to protect them from a danger so rife has set up the demand for such protection as may be afforded by legislation. The Departmental Committee on Epizootic Abortion was appointed in response to requests of stock-owners. Its first report, issued in June last, shows that its investigations largely confirm those of Dr. Bang, of Denmark, and prove the identity of the disease in Denmark with that prevailing in the British Isles. The report also gives the outcome of experiments directed to the discovery of a means of diagnosing the existence of the disease before the act of abortion occurs, and of others directed to the discovery of means for rendering cows and heifers immune from the malady, and so protecting them from the risks of infection.

It is reported that a material, called by the Committee "Abortin," prepared on the lines of tuberculin and mallein, gave excellent results in the laboratory experiments in detecting the infected cows in a herd before they aborted; also that other tests of a laboratory character are reliable.

It was likewise found that large quantities of pure virus could be inoculated or fed to non-pregnant cows without serious injury to them, and that animals so treated appeared to have conferred on them a high degree of immunity. It is stated that investigations in both directions yield great promise and are now being put to the test in some infected herds in the country, the results of which will be published in a future report. It is not suggested by the Committee that the knowledge so far acquired is sufficiently mature for general application, but should the laboratory tests be confirmed by the field operations, the solution of the problem would be distinctly advanced. In May last the Departmental Committee was extended so as to include "an enquiry as to the administrative measures, which, in view of the results of the investigations made, should be taken to deal with cases of the disease, and to prevent the spread of infection." Witnesses from representative Agricultural and Breed Societies have been examined, and it appears likely that an Administrative Order will be framed on the findings of this Committee, unless agricultural opinion is very strong against its provisions.

Though there is probably some difference of opinion between those owners whose herds are affected and those whose herds are free, there appears to be a general feeling that the time has arrived for making a serious attempt to suppress the scourge or, if we cannot exterminate it, to control it. No objection can be taken to the view expressed by the Departmental Committee in a circular letter, sent out to agricultural associations on 6th of July last, which stated that in their opinion "an Order should aim primarily at protecting the general body of owners of cattle from the risk of the disease being spread from infected premises by the movement of cattle from such premises."

Any such Order must involve compulsory notification of every case of Epizootic Abortion in Cows, and as the owner is not in a position to distinguish between a case of epizootic and one of sporadic form, and as the proportion of abortions not due to contagion is very small, every case of abortion should be notifiable. The expert is, by microscopical examination, able to determine whether a case is one of Epizootic Abortion, so that investigation by the veterinary inspector of the local authority must follow immediately on notification. Restriction or movement must be the means adopted, and certainly, in any attempt to eradicate the disease in a short period, this must apply alike to cows which have aborted and pregnant animals, which have

been exposed to the risks of infection by being associated with aborting cows. The great prevalence of this disease and the widespread disturbance of business which would ensue on the adoption of such restrictions, would undoubtedly prove somewhat serious. The questions arise, Is it expedient at the present moment to make an heroic attempt? Are there any grounds for delaying such action? If contagious abortion prevails as extensively as many people think, it is to be feared that the restriction or movement of cows which have aborted, and such as have been exposed to infection, would not enlist the cordial co-operation of those whose herds are affected, and without this it is very doubtful if the object would be accomplished within a reasonable period. Further, and it surely must be a very important consideration, in view of the great promise of the experimental work on which the Departmental Committee has been engaged for more than four and a half years, it seems imperative that any practical means calculated to accelerate the accomplishment of the object and make it easier for the stock-owner, whose misfortune it is to possess an infected herd, should be placed at his disposal before the heaviest possible burdens are thrust upon him. The power to discover prior to abortion which of his cows are infected, and a practical means of protecting his females from risk of infection, would indeed render solution of the problem comparatively easy. Owners of healthy herds are, however, entitled to protection, and as a means of securing this to a considerable degree, all cases of abortion should be notified and investigated without delay and the movement of cows which have aborted should be restricted. Such a measure would have the effect of drawing more general attention to the contagious nature of abortion, of educating the owner of aborting animals in the means of getting rid of the disease, and of apprising the Authorities as to the extent of its existence, while it would provide the intending purchaser of breeding animals with useful information as to the sources of danger.

Whether the prospect of the adoption of legislative measures be near or far, it is important for the stock-owner to realise that very much may be done towards getting rid of the disease in any herd by isolation and disinfection and by an intelligent regard for those matters placed at his disposal by experimental research. Certainly he whose herd is free from the disease, when the provisions of an Order come into operation, will stand the best chance of not being subject to its annoyances, while, at the same time, he will be in a position to take advantage of the protection it may afford.

Red-Water in Cattle.

This ailment, commonly known from its most prominent symptom as *Red Water*, has been from early times recognised in various parts of Great Britain, but, perhaps, more particularly in what is the more immediate sphere of operations of the Bath and West Society. It has always been regarded as a malady to which cattle in particular localities—moors, certain farms, and even particular fields, are specially subject. Though cases may be occasionally met with in other seasons, the larger number are observed in animals at grass in the spring and early summer and again in the late autumn, while less frequenty it affects cattle indoors. This disease manifests itself with varying degrees of severity or mildness. In some instances the general health is not appreciably affected, perhaps no other symptom than a little redness of the urine being noticed. In other cases there may be great systematic disturbance with fatal result after a rapid course. It has long been noticed that the more severe attacks affect purchased animals, or such as had not previously been on pastures liable to the disease. An attack is also sometimes very severe in animals bred on Red-Water farms when it supervenes upon some other form of illness, *e.g.*, a difficult calving is said to determine the severity and frequently the fatal issue.

Among cattle bred on farms given to Red-Water, the young are more frequently attacked, and the course is often short and mild. Such animals generally recover without medical aid, which in the majority of cases with more severe manifestation appears of no avail.

The circumstances narrated as to localisation of this malady have had the effect of associating its cause with conditions prevailing in certain localities, and particularly with the nature of the soil and pasture, on which it is believed to have been acquired. Poorness of pasture in nutritive qualities is mostly blamed. A particular constituent of the fodder—for example, an excess of oxalic acid—has been held to be responsible for the mischief. In some very primitive parts the passing of red-coloured urine has been put down to the exercise of witchcraft.

The farmer who breeds his own stock on a Red-Water farm knows, that, if on the early appearance of symptoms of the disease in his young cattle, they are changed from poor to better pastures and well fed, a large proportion of the affected stock will soon improve and the urine become of normal colour. As he usually gives a dose or two of common salt or Epsom salts, he enjoys the satisfaction of having

"cured" them. When animals bred on farms, on which Red-Water is not known, are brought on to Red-Water farms, they, especially if adults, are liable to severe attacks, with high temperature, great depression, etc., and not infrequently such attacks terminate fatally.

Up to a comparatively recent period the redness of the urine was believed to be due to blood mixed with it, and the technical name Hæmaturia, signifying "blood in the urine," was applied to it. Improved methods of examination showed the redness to be due to the blood colouring matter dissolved out of the red corpuscles and that blood does not appear in the urine, a discovery which led to the adoption of the name Hæmoglobinuria.

Diseases of cattle yielding similar symptoms have been recognised in other parts of the world. In America "Texas Fever," which appears to be closely allied to our Red-Water, was subjected to experimental research, and in 1888 it was reported that certain microscopic parasites were discovered in the red corpuscles, which in all probability liberated the red colouring matter, or *hæmoglobin*. These minute parasites are classified as part of the animal kingdom, and are known as *piroplasms*; hence the name *Piroplasmosis* now given to the disease. This discovery led the way for great and rapid advance in knowledge of several maladies of animals in various parts of the world, whose nature was before very obscure, but the initial demonstration of the piroplasm in the red blood corpuscle, though accounting for the appearance of the red-colour in the urine, did not clear up all the obscurity. It was proved that if blood taken from an animal suffering, or having apparently recovered from the disease, was inoculated into a healthy animal, the latter contracted the disease. It was, however, observed that, unlike that which happens in most other communicable diseases, healthy animals, which come into contact with others affected with "Texas Fever," did not soon become affected.

The method of infection remained to be explained. Fortunately it had been noticed that the subjects of Texas Fever were very often infested with ticks, and these parasites of the skin were vaguely suspected of being in someway concerned in producing the disease. Further investigation demonstrated the same *piroplasms* in the bodies of ticks removed from the skin as are found in the blood of affected cattle. As ticks are known to suck the blood of cattle, it was concluded that this disease was communicated from the affected to the healthy through the agency of cattle ticks, which first sucked the blood of bovine animals containing piroplasms,

and then attached themselves to unaffected animals and inoculated them. The process, however, is not quite so simple as this bald statement may make it appear. But the facts revealed up to this point led to a closer study of the life history of the varieties of the tick family, which are parasitic to the domesticated animals in different countries. Circumstances will not permit of our following these investigations farther than to state that when the adult female tick has engorged herself with the blood of her host she falls off and deposits eggs from which *larvæ* are developed. These are believed to attach themselves to dry grass, etc., thence to get on to the skin of some animal, it may be ox or sheep. When the *larvæ* have repleted themselves with the blood of their host, they drop off and undergo further development into *nymphæ*, which repeat the procedure, and after dropping off become transformed into adults, in which state they again attach themselves to some animal of the species of which they are natural parasites. Impregnation of the female now takes place and another cycle commences.

The relation of ticks to cattle disease has been very carefully studied in South Africa, the Transvaal and East Africa, where forms of Red-Water of very destructive types are common, and at one time promised to be a serious element in deterring agricultural progress. In these countries it has been proved that these parasites play a very important part in spreading disease due to piroplasms, and from the reports of scientific investigators it appears that these minute organisms in various diseases may be conveyed from diseased to healthy cattle by ticks in different phases of their development. Several years ago Nocard reported the discovery of organisms similar to those found in Texas Fever in the blood of animals affected with Red-Water in the British Isles. It is now known that this organism is the *Piroplasma-bigeminum*, and the disease is accordingly named *Bovine Piroplasmosis.* It is probably only communicated by inoculation. According to M'Faydean and Stockman, who have done valuable work in this direction, if the blood of an animal suffering or recovered from Red-Water is inoculated into a susceptible bovine animal, piroplasms may be found in its blood from six to ten days after, and, as a result of the inoculation, the temperature rises to a high point, and sometimes red urine is passed. In experimental cases this last symptom, which has given the disease its name, is by no means constant. It is therefore quite possible that in naturally contracted Piroplasmosis, red urine may not be passed. It is somewhat important to bear this in mind, also that it has been proved beyond doubt that for some time (several months) after apparent recovery the blood of animals contain

piroplasms capable of inducing the disease if the blood is inoculated into healthy animals; hence, animals, which are not passing red water, may nevertheless be the unsuspected source of supply of the piroplasms on which the disease depends.

Cattle and sheep in Great Britain harbour ticks of different varieties. One variety—*Hœmaphysalis Punctata*—has been subjected to investigation at the laboratory of the Board of Agriculture, and it has been shown that if these ticks in the phase of *nymphœ* are placed on and allowed to suck the blood of an ox containing the *Piroplasma bigeminum*, they are when developed into the adult stage, capable of inducing *Piroplasmosis* or Red-Water if placed on the skin of susceptible cattle. It seems highly probable that another variety of tick, which is believed to be most common on our cattle, is imbued with the same power. It will, however, have been observed that something more than the presence of ticks is essential to the production of this disease. It has not yet been proved that ticks are the only skin parasites which may possibly convey the infection, indeed, it has been shown that the infected blood taken by an experimenter and directly inoculated will infect a susceptible animal. Therefore it may be concluded that passage through ticks is not essential. It is equally certain that unless the tick can obtain the piroplasm it cannot communicate the disease. It is not known that the piroplasm is to be found elsewhere in nature than in the blood of cattle affected with or recovered from Red-Water. Ticks infest cattle in situations where there is no Red-Water, but as far as we know, Red-Water does not appear in situations where there are no ticks. The reason why this disease has such an abiding influence in certain situations is that in those situations there are cattle with piroplasms in their blood and ticks to convey them to other susceptible animals. If either is absent the disease does not occur. If ticks exist on a farm, where Red-Water does not, all that is necessary to establish it as a Red-Water farm is the introduction of an animal whose blood contains the piroplasm. In the prevention of Red-Water we may aim at eradicating the ticks, or preventing them from obtaining the piroplasms.

The eradication of ticks is not an easy matter. If their life history is followed, it will be remembered that only a part of their life cycle is spent on animals. Larvæ, nymphæ, and adults leave the host at each stage and live awhile on the ground, so that the application of medicinal agents would be necessarily frequent if all ticks are to be subjected to their effects. A great deal may, however, be done to reduce the number of ticks and so lessen the chances of infection. As cattle ticks live on sheep and do not induce Red-Water

in them, it has been advised that large numbers of sheep should be placed on infested pastures with a view of attracting ticks and afterwards destroying them by frequent dippings in arsenical or paraffin dips, and a study of the development of ticks would indicate that this should be done every tenth or twelfth day in March, April, May and June, and in October and November; a procedure, which on account of its trouble and risk is not likely to commend itself to the stock-owner. Frequent dipping of sheep grazed on infested pastures, and washing of infested cattle in the above dips, will, however, materially reduce the number of ticks. When there is a considerable amount of dry grass on infested pastures, a large number of ticks in various degrees of development would be destroyed by burning it, either standing or after being cut.

The method most easily practised and most likely to prove successful in eradicating the disease and rendering pastures permanently safe, is that of keeping all cattle off infested pastures for a long period (15 to 18 months), and stocking with sheep. Under all circumstances, as sheep do not contract Red-Water, while they attract ticks, it is well that sheep should graze on Red-Water pastures and be dipped as often as may be convenient and safe.

It has been previously stated that cattle bred on Red-Water farms usually manifest this disease in a mild form, while adult animals bred on clean farms, when brought on to Red-Water farms often contract the disease in a severe and even fatal form. It was inferred from these observations that cattle bred in situations given to Red-Water acquired a degree of immunity by being inoculated in their youth with comparatively small numbers of the piroplasms, becoming only slightly affected, and so able to resist larger doses in later life. This suggested purposeful inoculation with small doses of infective blood with a view of artificially producing protection. Experiments appear to indicate that such a process is comparatively safe and effectual so far as the inoculated animal is concerned. There must, however, be a certain degree of danger associated with introducing the piroplasms into the blood of cattle in situations where ticks abound, as these may attach themselves to the skins of inoculated animals after recovery, and by sucking the blood be capable of communicating the disease to other cattle. In South Africa, where disease, due to these micro-organisms is of a very severe and fatal nature and affects wide areas, protective inoculation has proved of immense benefit. It is quite within the range of possibility that in some severely affected localities in Great Britain, where other means are not practicable, this plan may be adopted with advantage.

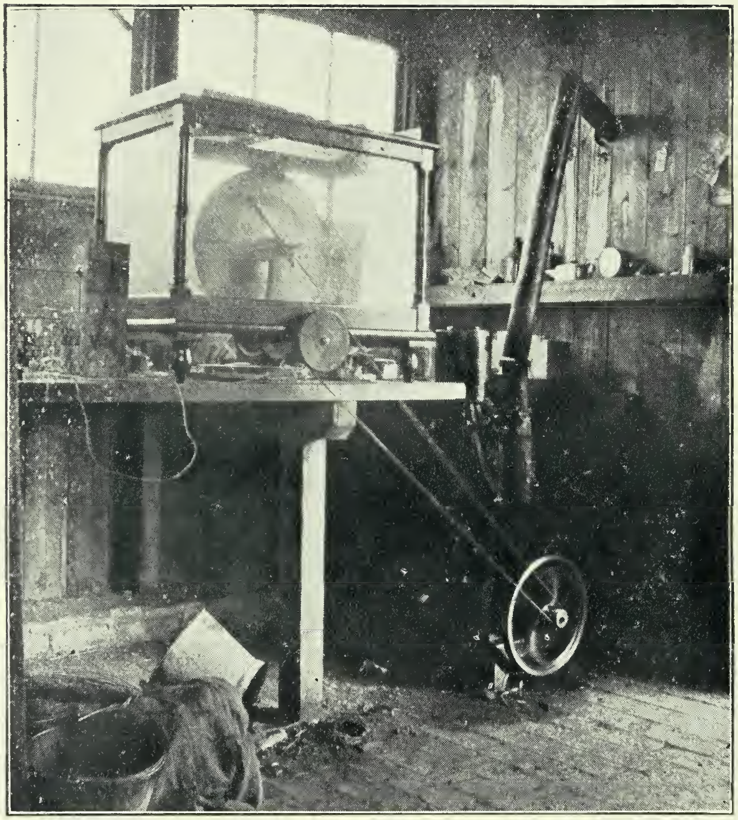


Fig. 1.—Wimshurst Influence Machine and Vacuum Engine
Used in original experiments at Bitton, near Bristol.

Within the past year a report has been published giving the results of curative treatment with a material known as Trypanblue. The experiments seem to prove that this drug has some effect on the piroplasms in the affected animal, but the test has not yet been carried far enough to allow of a reliable opinion as to whether it is likely to be of practical value.

II.—THE APPLICATION OF ELECTRICITY IN AGRICULTURE AND HORTICULTURE.

By S. Leonard Bastin.

Recent investigations point to the fact that natural electricity plays an important part in the growth of plants. Lemstrom went so far as to attribute the intense activity of vegetation in northern regions during the summer, to electrical influence; though the prevailing impression is that the phenomenon is due to the very complete rest which the plants are there bound to take during the long winter. However this may be, it has been shown that, as a whole, plants are more affected by applied electricity than are animals—not the least important result being a decided increase in the rate of growth.

Origin of Electrical Experiments.

That the idea of stimulating the growth of plants by means of applied electricity is not new may be gathered from the fact that a Scotchman named Maimbray carried out some experiments with two myrtle bushes as long ago as 1746. Naturally these were of an elementary nature, very different from the elaborate enquiries which have since been conducted. A few years later, the Abbé Nollet placed seeds of various kinds on insulated trays, and it is recorded that these started into growth more quickly than the same kinds normally grown. Thenceforward there has been an almost continuous chain of experiments, and the complexity of the subject is well realised when it is considered that all these investigations have as yet been of very little practical value. With a few trifling exceptions, electricity is not used in the cultivation of plants for commercial purposes. In spite of this apparently discouraging state of affairs, no one interested in the production of crops can afford to ignore the question of electric

culture. Already there are signs that the efforts of man to utilize this force of nature are nearing success, and it is not very rash to prophesy that there will be a widespread use of electricity amongst farmers and gardeners in the near future.

LEMSTROM'S EXPERIMENTS.

Of recent years the most elaborate series of experiments have undoubtedly been those conducted by Professor Lemstrom. These extended over a considerable time having been started in 1885 and continued with a few intervals until 1903, in which year the experimenter died. The necessary electricity was obtained by means of a special influence machine ; one pole of the apparatus being carried to the earth whilst the other was conveyed to an arrangement of wires strung over the plants, from which the discharge was distributed by means of points. The experiments embraced a very large variety of plants, including a number of agricultural crops as well as certain kinds of fruits and vegetables. Some of the investigations were on a large scale, far in advance of anything that had ever been attempted before. Further arrangements were made to carry out experiments on similar lines in different parts of Germany, Finland and Newcastle, England. In this country the enquiries were conducted at the Armstrong College under the care of Professor Thornton. One of the greatest difficulties in these experiments, as indeed in all others connected with growing crops, consists in insuring an absolute uniformity between the control and the experimental crops. Now, although the Lemstrom investigations yielded much contradictory evidence, it was shown conclusively that a definite increase might be expected from the electrical treatment. It was considered by the scientist that, at a low estimate, an increase of from 35 to 40 per cent. might be looked for as the outcome of the system in the case of certain crops. A number of valuable points were established which have proved of great service to later experimenters. Good proofs were obtained that there was a danger of over-stimulation, especially in very bright weather, when the application of the current was of little benefit and might even be harmful. Moreover, under the influence of electricity, all classes of crops seemed to require more moisture, and many initial failures were due to an insufficient supply of water. It is very important that all those interested in the application of electricity to crops should bear these points in mind as they are certainly fundamental principles applicable to all systems.

The Experiments of Mr. J. E. Newman.

It is certainly a matter for congratulation that, following the death of Lemstrom in 1903, the question of applied electricity to growing crops was taken up by an Englishman, Mr. J. E. Newman, of Gloucester. During the year 1904 a plant, consisting of a small influence machine and an oil engine, to maintain the generation of the current (Fig. 1.) was established. These experiments were carried out at Bitton, near Gloucester, and the system employed was that of a Wimshurst machine ; this together with the vacuum engine is shown in an accompanying illustration. The charge was distributed by means of a system of wires, one terminal being carried to the earth. The wires in these initial experiments were fixed about eighteen inches above the ground. The results of the trials were so promising that Mr. Newman decided to carry out a much more elaborate series of experiments on a large farm belonging to Mr. R. Bomford, of Salford Priors, near Evesham. Fortunately the sympathy and interest of Sir Oliver Lodge were engaged, and it was largely through the generosity of this eminent scientist that the completion of the installation at Salford Priors was rendered possible. By this time it had been realised that Lemstrom's system was not really practicable, chiefly because the wires were too near the ground. In the new installation, the poles carrying the wires were quite fifteen feet in height, and, being placed in widely separated positions, they did not in the least interfere with any conceivable form of farm or garden crop. An idea of the appearance of the conducting wires may be gathered from the picture showing the cattle grazing under the installation. (Fig. 2.) It may be added for the information of those having fears for the safety of their live stock that the fully charged wires are not in any way harmful to the animals beneath. The principal wires between the poles are crossed at intervals of about thirty feet by thin wires, which insure the widespread distribution of the current.

The Electrical Apparatus Described.

It may be of interest briefly to describe the apparatus by means of which the electric current is generated. Of course should there happen to be an electric light cable in the district where any experiments are being carried out an independent installation would be unnecessary. As most people are probably aware, the generation of electricity is accomplished artificially by means of a dynamo, an apparatus the principle of which consists chiefly in revolving a coil of

copper wire around a magnet at a high rate of speed. Naturally a certain amount of power is necessary to obtain the movement, and this is supplied by an ordinary gas or oil engine. Now, as has been stated in the Newman experiments, the wires which convey the currents are carried at a considerable height above the ground, and on this account in order to be effective the electricity must be discharged at a very high tension. There seems to be a good deal of misunderstanding concerning that which is known as the tension or potential of electrical current. When it is said that electricity is of a high potential it does not necessarily mean that the quantity involved is very great. Sir Oliver Lodge has explained that, even when the natural electricity has accumulated to such an extent that a violent thunderstorm is the result, the actual *quantity* of electricity is frequently very small. Of course in the violence and power of the flashes there is evidence that the *potential* and *tension* are simply enormous, although this is only in operation over a very brief period. Some years ago Sir Oliver Lodge patented an apparatus for the rectifying of electrical current, and it is this device which has been installed at Salford Priors. Without going into technicalities, which are somewhat confusing to the average individual, it may be stated that the plant consists of vacuum globes for the rectifying of the current and a " transformer " which is an induction coil containing miles and miles of wire. All this apparatus is housed in quite a distinct shed from that containing the dynamo and engine. Most people on seeing the transforming plant can scarcely realise the powerful influences which are at work for there is very little movement to be seen. Beyond a slight hissing noise, and an occasional glowing of the globes, there is nothing to indicate that the current is leaving the shed for the fields at a potential which may be as high as 100,000 volts. Of course, as previously stated, it must always be borne in mind that this high tension has little to do with the actual quantity of the electricity involved. It is well known that there are two poles in the electric current, and that the course of the charge is in a circular direction. In the case of the experiments under consideration the positive pole is connected with the overhead system of wires, whilst the negative pole is carried to the earth. Thus we must imagine the electric discharge as passing along the overhead system of wires down through the growing plants to the earth, and in this way completing the circuit. It is interesting to remember that in a natural state the electrical condition of the atmosphere is almost always positive, so that in supplying the current on the lines indicated, one is only intensifying the normal state of affairs. As to the exact effect which the current

Fig. 2.—Cattle Grazing under Charged Wires.

Fig. 3.—Electrified and Unelectrified Wheat Grown in a Garden at Gloucester by Mr. J. C. Dennis.

Fig. 4.—Wheat Growing in Electrified Portion of Field at Bevington, near Evesham, 1909.

Fig. 5.—Wheat Growing in Unelectrified Portion of Field at Bevington, near Evesham, 1909.

Fig. 6.—Potatoes Growing in Electrified Portion of Field at Bevington, near Evesham, 1909.

Fig. 7.—Potatoes Growing in Unelectrified Portion of Field at Bevington, near Evesham, 1909.

may have upon growing vegetation it is as yet impossible to say anything very definite. All kinds of suggestions have been advanced to explain the part of electricity in the life of the plant. One theory is in favour of the view that the electric current assists in the formation of starch by the green plant, even though light be absent. Another conception deals with the absorption of insoluble food by the plant; electricity, it is said, increases the power of vegetation to imbibe particular elements. Finally, it has been supposed that electricity has a nitrifying effect on the soil, in this way causing a manurial change in the character of the land. These are only three suggestions out of many which have been advanced to explain a matter which will probably occupy our botanical physiologists for some time to come. After all there is no reason why it should be necessary to wait until we have a complete understanding of the problem before we turn what knowledge we may have to practical advantage. Although used so often with safety and success it is a fact that the action of chloroform, or any other anæsthetic for that matter, is imperfectly understood. In the same way if we can show a definite increase in our crops by the application of electricity, it is not an essential point that we should have a complete understanding of the phenomenon, though such a state of affairs is extremely desirable from many points of view.

The apparatus for supplying the current although somewhat formidable to look at, was proved to be exceedingly easy to manage. It consisted mainly of an oil engine, dynamo, and a transformer for converting the current into high tension. For days together during the experiments the generating appliances were controlled by a youth.

The Results of the Newman Experiments.

An accident to Mr. Newman, coupled with defects in the apparatus, prevented the experiments during 1906-7-8 from being so complete as was desired. As it was, however, the results in connection with wheat were very striking. Even in the early stages of growth the development of the electrified wheat was markedly superior to that grown in the control plot. (Fig. 3). Roughly speaking the electrified wheat grown during the three years showed an increase of about 30 per cent. over the grain produced in the control portion. Moreover, in almost all cases, it was proved that the electrified wheat produced a better flour; one more satisfactory for baking purposes and richer in dry glutens. It was not only corn which was brought

under the influence of the electrical machines. During the three years under consideration various kinds of fruits and vegetables, such as strawberries, tomatoes, cucumbers, broad beans and beetroot were tried. The evidence obtained during this period was not always of a positive nature, although, in nearly all cases where the produce from the electrified plot was less than that produced by the control section, a marked earliness in the maturing of the crop was noticed. In this case the early ripening of the fruit would be peculiarly valuable.

THE LATEST RESULTS OBTAINED AT SALFORD PRIORS.

It will be of interest to give some of the most important conclusions which have been arrived at as the outcome of the experiments conducted during the season 1909. The accompanying photographs show very plainly the striking results in the appearance of the standing crop obtained from electrification. (Figs. 4, 5, 6 and 7.) In both the potato and wheat field the additional growth indicated by the scale is due entirely to electrical influence.

Unfortunately, up to the moment of going to press the actual weights of grain and tuber in the control and experimental plots are not available. The wheat has not yet been threshed, whilst the potatoes have been stored away pending the time of their disposal when of course the exact weight will be revealed. It is almost certain that there will be a very big yield from the electrified plot of potatoes; moreover some samples of the tubers which have been tried show a distinctly improved flavour in the case of the specimens from the experimental field. As showing what has been done in the case of strawberries this season it may be mentioned that over 35 tons of fruit have been gathered from eight acres of land.

ACTUAL RESULTS WHICH HAVE BEEN OBTAINED BY EXPERIMENTERS.

In reviewing the whole question of artificially applied electricity it will be of interest to detail a few of the most striking results which have been placed on record. During the last experiments which were conducted at the Durham College under Lemstrom's system in 1903, the following striking results were obtained in the case of sugar beets and potatoes. In the case of the former the increase was 49.6, whilst the latter showed an advantage in favour of electrification of no less than 65.5 per cent. Moreover with the beet crop there was to be observed a definite increase in the amount of sugar

present due entirely to the treatment. In the Newman experiments the actual results obtained in the case of a series of special tests in 1905 are given in the following table :—

Cucumbers, 17 per cent. increase ;
Strawberries (5 year plants) 36 per cent. increase ;
Strawberries (8 year plants) 80 per cent. increase, and more runners produced ;
Broad Beans, 15 per cent. decrease, but ready for picking five days earlier ;
Cabbages (Spring) ready for picking 10 days earlier ;
Celery, 2 per cent. increase.

The small increase apparent in the last named was probably due to the fact that there were defects in the system of wires used for discharging the current. One interesting point in connection with the cucumber crop should certainly be mentioned. These plants were of course in a glass house, and during the month of May a serious spot disease made its appearance. It is asserted that the plants growing in the electrified house were much less harmed by the trouble than those in the control establishment. During the same year another set of experiments was conducted in a vegetable garden at Gloucester. With the crops under electrification it is recorded that :—

Beets showed a 33 per cent. increase ;
Carrots showed an addition to the normal crop of no less than 50 per cent. ;
Some turnips which, owing to the ravages of slugs on both crops were not weighed, also appeared to show an increase.

On analysis at Gloucester College it was found again that electricity had increased the amount of sugar in the beet crop. The figures were as follows :—

The unelectrified yielded 7.7 per cent. total sugar ;
The electrified ditto, 8.8 per cent. total sugar.

A typical instance of the trials in connection with wheat may be given as showing the nett increase in yield as the result of electrification :—

Canadian (Red Fife), electrified, $35\frac{1}{2}$ bushels per acre ; non-electrified, $25\frac{1}{2}$. Increase 39 per cent.
English (White Queen), electrified 40 bushels per acre ; non-electrified 31. Increase 29 per cent.

In addition to the above increased yield it was observed that on the experimental plot the straw was from four to eight inches higher than was the case in the control section.

THE USE OF ATMOSPHERIC ELECTRICITY.

Within recent years a very interesting series of experiments were carried out at Amherst, Mass., U.S.A., to show the effect of electricity on germinating seeds and growing plants. The current was collected in the following way. A number of poles, about 50 feet in height, were erected at intervals over the land under treatment, and on the top of these were affixed copper spikes. By this means the positive electricity was drawn away from the atmosphere and conducted to the foot of the pole. Thence the flow was conveyed along wires, a little way below the soil, and thus distributed amongst the roots of the plants. Of course, in order to test the full worth of the method, control plots with complete sets of duplicate specimens were cultivated for comparison. In the case of seed germination, it was found that in a certain period 30 per cent. more examples had started when the current was applied than in the instances under normal cultivation. A few years later, the experiments were elaborated to embrace the matter of general crop cultivation, with the help of electricity. Two plots of land were sown with parsnips, lettuce, carrot, turnip, radish and onion. In one case the electric currents were allowed to stimulate the crop, whilst in the other instance the culture was of the ordinary kind. In nearly all the plants the difference between the two sets was extraordinary, the examples in the electrical plots being nearly twice as high at the end of the season as those which had been grown normally. Better still, the root crops were wonderfully benefited by the novel treatment, showing in all cases a distinct advance upon those grown in the usual way. As a proof of the enhanced weight of the roots, and in spite of the fact that the plants in the electric section bore such a profusion of foliage, there was a pound of undergrowth to every pound of leafage. In the non-electric division, nearly one and a half pounds of foliage were represented by only a pound of root formation. Almost the only plants which did not show any marked increase were lettuces, the results in these cases being practically negative.

THE NEED FOR FURTHER EXPERIMENTS WITH ATMOSPHERIC ELECTRICITY.

It is surely a pity that at the present time more attention is not being given to the question of tapping the vast supply of atmos-

pheric electricity. However efficient and economical an electrical appliance might be, it would certainly compare unfavourably with a simple arrangement for using natural electricity—provided that the latter could be devised on effective lines. All experiments seem to show that plants are not benefited by the application of very strong electrical influence. Mr. Arthur E. Baines, after a course of investigations spread over 30 years, has even gone so far as to declare that a current of high tension introduced into a field is a sheer waste of energy. A milder charge would be more likely to bring about an improvement in the crops. It is a curious factor in the consideration of the subject that a general system of using the atmospheric electricity would almost certainly have an effect upon the weather. The easy passage of the electricity from the air to the earth by the agency of thousands of metallic points would be calculated to prevent a great accumulation in the clouds. Thus, thunder and probably hailstorms would be of less severity, if, indeed, they might not be banished altogether.

The Use of Earth Currents.

Another method of employing natural electricity is that in which the earth currents are used. In France and in Russia experiments have been conducted by means of metal plates sunk in the ground between the plants. The current which passed between the plates appeared to induce a more vigorous growth than was to be observed in specimens cultivated in the control plots. A Russian scientist, Spechnew, is said to have obtained the most encouraging results by simply using plates of different metal connected by wires. In America the same line of research has been followed at Arlington, Mass. Zinc and copper plates connected up by wires are buried at either end of beds in forcing houses. Although lettuce has given negative results in most electrical experiments, in this particular case it is declared that the crop was brought to perfection a week earlier by the use of the currents. In 1906, at Gloucester College, a series of experiments, under the care of Mr. J. E. Newman, was conducted with the object of finding out the value of earth currents in the stimulation of crops. A number of plants, including wheat, barley, maize, as well as some garden crops, such as beans, cabbage, and carrot, were brought under cultivation. It was noted in some cases that seeds germinated more rapidly, whilst, in nearly all instances, the plants which were subjected to the current showed a better development.

PLANT GROWING BY ELECTRIC LIGHT.

In the United Kingdom, where the lack of sunshine is often a great hindrance to the production of garden material, the question of a substitute for the solar rays has often been mooted. Market gardeners who raise quantities of stuff under glass would be placed in a much better position if they were quite independent of weather change. The artificial illuminant might be used in two ways; either to make up for a deficiency of sunlight, or to stimulate an extra vigorous growth. Certainly the most interesting system was that patented a few years ago by the late Mr. B. H. Thwaite. Most unfortunately, the experiments were cut short at a very interesting stage by the death of the inventor. The enquiry, which was prosecuted at the Royal Botanic Society's Gardens at Regent's Park, was most interesting, and, as a member of the Inspection Committee, the writer was able to make a very close examination of the trials. The original experiments were based on the idea that plants do not in this country grow to their fullest extent. This is almost entirely due to the lack of sunshine, as is well proved when similar species are grown in California. There, the average of increased productiveness is double that which it is in the British Isles. It can, therefore, be shown that, if electric light is a sufficient substitute for sunshine, under its influence the general activity of plants would be four times the normal for November and no less than eight and a half times the usual for December.

In the experiments which were conducted at Regent's Park it was shown that the rays from an electric arc very nearly approximated to those of sunshine. By an ingenious arrangement, it was contrived that the light should be kept continually on the move, in order to bring about as even a distribution of the illuminant as possible. The lamp itself was protected by a water screen, through which the rays of the light pass. The back and front of the lamp are shown in accompanying photographs. (Figs. 8 and 9.) This screen was intended to secure as near an imitation of natural solar effect as possible; the device tending to keep back the ultra-red rays which hinder the formation of green matter, whilst giving a free passage to the violet actinic light. Two greenhouses were brought into the experiments, one in which the light was administered and the other in which the plants could be grown under normal conditions. The two sets of plants were selected with great care so that they should be as nearly alike as possible, and throughout the enquiry received equal attentions from the Society's gardeners.

The Results of the Thwaite Experiments.

The experiments at Regent's Park were started in the autumn, and, in the first place, the illuminant was only used to extend the daylight for four hours. The plants under treatment were geraniums, cannas, chrysanthemums and tomatoes. Just before sunset every day the electric arc was started, and to see the brilliant glare sweeping up and down the long greenhouse was a strange sight. Even after a month's treatment there were some interesting results. Many of the illuminated plants grew much more rapidly than those in the control house; some of the chrysanthemums came prematurely into bloom, whilst in the case of the geraniums there was an increased amplitude of leafage. The chrysanthemum plants especially grew at a great rate and many of the electrified plants were more than double the height of those in the control house. The difference is well seen in the photograph. (Fig. 10). Moreover, it was observed that the foliage of the plants assisted by the artificial light was of a deeper green shade, seeming to point to a more perfect elaboration of chlorophyll than was the case in the control section. There was not the least doubt that the specimens were greatly affected by the light and the opinions of most experts was that the plants were, if anything, over-stimulated. This was especially noticed in the case of the young tomato plants, many of which were certainly lanky although showing an amplitude of leafage. The taller plant in the picture is that which was grown with the illuminant. (Fig. 11.) As has been indicated, the experiments were cut short at a most interesting stage, and although efforts were made to carry them on these were entirely unsuccessful. It is a great pity that some one cannot be induced to take up the enquiry in a systematic manner at the present time.

The Practical Side of Electrification.

It would be useless for practical purposes pursuing these experiments in connection with the electric treatment of plants if the enhanced value of the crops did not show a substantial profit over and above the additional expenditure. In this connection an interesting estimate has been drawn up by Mr. J. E. Newman. He has calculated that to treat thirty acres the initial cost of the installation would be £300. As an example, he has taken strawberries as the crop, and, as the result of his own experiments, he considers that the total annual upkeep of the plant (including depreciation of insulators, poles, etc., cost of running the engine and labour) to be £63. Now the value of an average acre of strawberries is estimated

to be £36, and it has been shewn that with electrical treatment the increase would be not less than one third, or £12 extra per acre. After due allowance for picking and marketing the additional crop, we may reckon an extra £8 per acre as due to electrical influence. Even supposing that six of the acres were devoted to the growing of young plants, this additional amount of £8 for the remaining twenty-four acres would equal £192. After deducting the £63 for annual upkeep, we should still have a profit of £129 on an original outlay of £300 for the installation.

The Crops Most Suited for Electrification.

Whether the increased value of the crops obtained will stand the outlay for electrification depends, of course, entirely upon the nature of the material grown. Obviously, the system will be useless on grass farms, but where there is any amount of arable land it seems likely that a handsome return for the money might be expected. It would appear that the system should appeal, most of all, to large fruit growers, whose crops are so much more valuable per acre than cereals would be. The same expenditure of electrical energy in a fruit field would bring about a much larger increase than would be the case with wheat. It is suggested that fruit trees will yield good results, although here, as has been pointed out by Sir Oliver Lodge, there will be a real danger of over-stimulation. It will be quite useless to induce the trees to bear abnormal crops one year if we so exhaust the specimens that we suffer from shortage during the next season. In the case of annual plants, however, such a consideration does not count. Strangely enough, it would seem that most of the legumes are adversely affected by the application of electricity. At present, this fact is not very well established, but if it should be it will be a point of great interest, when we remember that, in rotations, leguminous plants are found to behave in an opposite manner to cereals.*

* The President of the Institution of Electrical Engineers (Dr. Gisbert Kapp), in a recent address to the Institution, said, with reference to the benefit which electricity had rendered to Agriculture, that Sir Oliver Lodge, by his researches, had enabled the old idea of the stimulaton of the growth of plants by electrification to be taken up in a practical way. About 12 farms were now fitted with apparatus for electrifying the air over the plants, and the average result on the 12 farms was an increase of 30 per cent. in the crops. Perhaps after a few years the soil would be exhausted by this intensive cultivation, but if that were the case electricity would supply the remedy.—Ed. B. & W Journal.

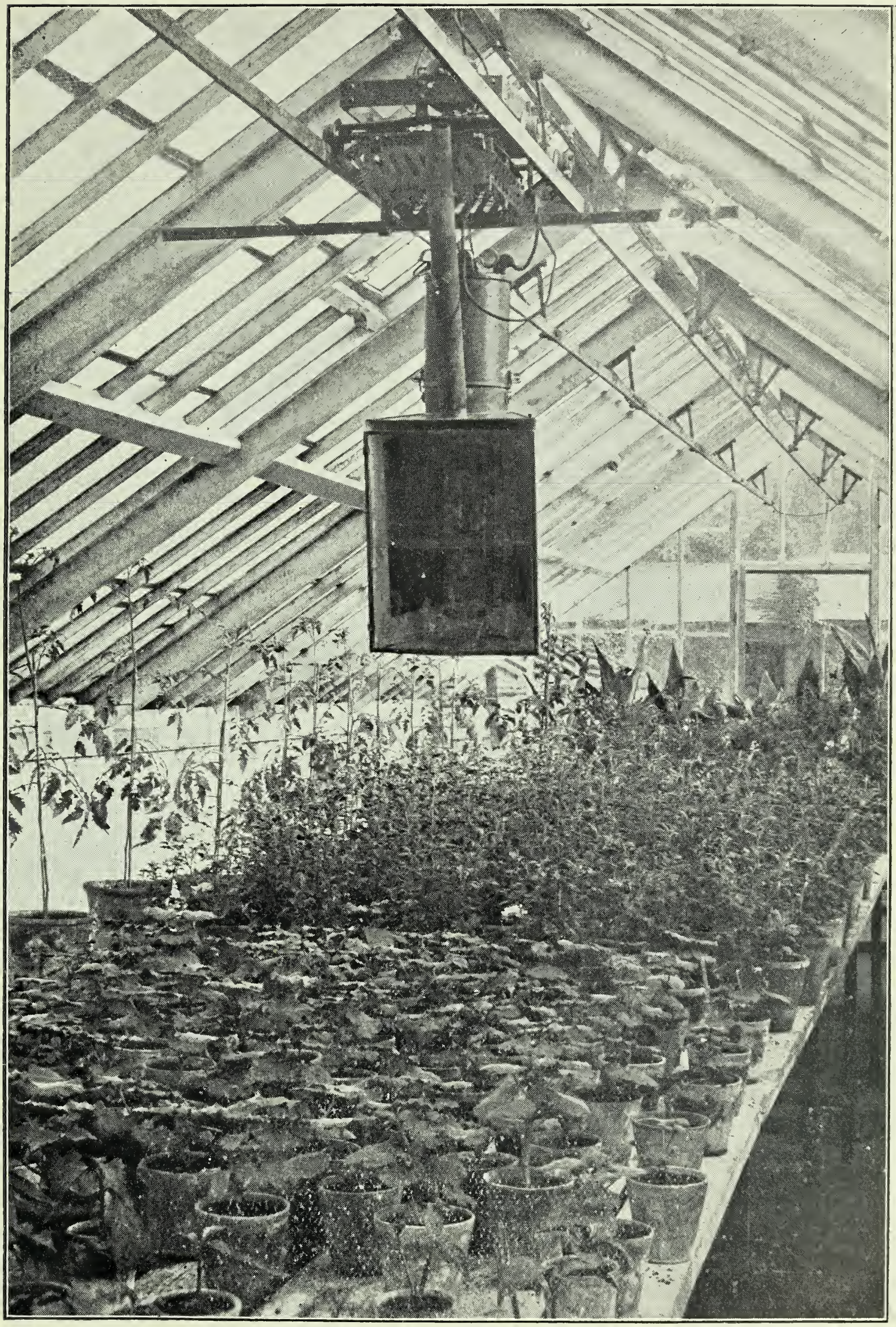


Fig. 8.—Thwaite Electric Light at Regents Park (Front View).

Fig. 9.—Thwaite Electric Light at Regents Park (Back View).

Fig. 10.—Chrysanthemums at Regents Park.

Fig. 11.—Tomato Plants Treated with Electric Light.

III.—FRUIT-GROWING LESSONS FROM EXPERIENCE.

By William E. Bear.

Although the experience of one fruit-grower is not in all respects necessarily a safe guide for another—any more than the results of manurial applications on one class of soil are bound to be the same on land of different character—yet the lessons derived from such experience may apply where circumstances are similar to those under which it was obtained. Moreover, there are some lessons which, so far as they are based upon careful and sustained observation, are of general application, because they have to do with general principles, and are not affected by differences of soil or climate.

The Choice of Land.

A deduction of a general character, whether well based or not, relates to the choice of land for fruit-growing. It is true that a man who intends to commence fruit-growing has very often practically no choice of land beyond the selection of one field or another on the same farm or estate. Unless he is prepared to sacrifice other interests to a new and speculative undertaking, or can afford to start his fruit-growing enterprise at a possibly great distance from his present place of settlement as an extra business, he has only the alternative of planting where he lives or not at all. But a young man not yet engaged in farming, or a man retiring from commercial or other pursuits, has, within limits, a choice of land. If he cannot purchase or hire land in one of the districts proved to be particularly suitable to fruit, he may do so in another, and experience and observation have convinced me that the character of the soil, with due regard to altitude, has a greater influence than nearness to a good market, or any other circumstance, upon the prosperity of commercial fruit-growing. The qualification as to altitude is necessary because a perfect fruit soil in a low-lying position, unless it is near the sea, should be rejected, on account of the extra liability to damage from frost, which its selection would involve.

It has commonly been stated by writers on fruit culture that any soil which will grow mangolds and wheat fairly will do for fruit. So it will; but such land will not necessarily produce fruit profitably in these times of keen competition, in which large yields of good quality are essential to success. Observations in the fruit districts, good and bad, in many counties, have convinced me that it would be better for a purchaser of land for fruit-planting to buy fifty

acres at £70 to £100 per acre in a specially good fruit district than a hundred acres of ordinary land at half the price. No visitor from a district of good agricultural but not special fruit soil can fail to be dissatisfied with his locality when he sees the splendid growth of plum trees with their great crops of fine fruit at Pershore, Evesham, or in the green-sand or alluvial districts of Cambridgeshire, and the side of Norfolk bordering upon that county; or the vigour of the apple trees, and the abundance and size of their fruit, in Herefordshire, Nottinghamshire, Middlesex, and parts of several other counties; or the perfection of plums, apples, and cherries alike in some of the best fruit districts of Kent.

In my own case there were limitations in choice of situation, such as comparative nearness to London, postal facilities, and early receipt of daily papers; but even these would not have shut out some excellent fruit soils, if it had not been for a fancy for starting my enterprise within easy distance of certain southern seaside resorts. Experience has since convinced me that no moderate distance from a good market counterbalances the great advantages of special fruit soils in insuring vigorous growth of trees and fruit of large size and good quality. Liberal manuring does, to some extent, but not fully, make up for comparative inferiority of soil, and only at a great expense. Although careful management and well directed expenditure may be rewarded with moderate success, this falls short of what may be attained at less cost on a really good fruit soil. In my own case, it is true, there is a large measure of compensation in almost complete immunity from damage by frost; but this is an incidental advantage which does not invalidate my argument, as it has to do with situation, and not with soil.

Shelter Trees and Hedges.

It is seldom that land taken for fruit is planted all in one year, partly because the crops of the preceding season are not in all cases such as it is desirable for planting to follow immediately, and partly in consideration of outlay and available labour. But it is an excellent plan to let the hedges begin to grow up at once, and to plant rows of shelter trees, or even belts of trees on the side of a field facing the direction of the prevailing gales, in the first season, except where there is natural shelter. It is in their young stages that fruit trees are most injured by exposure to gales, and when shelter trees are planted simultaneously with them, protection is lacking when it is most wanted. Where only one row of trees is planted, the advantage of an evergreen variety is obvious. The Austrian pine is frequently

recommended, but it is slow in growing to a good height, and is not as dense in foliage as could be desired. The *Cupressus Macrocarpa* will make double the growth in a given time, but is placed out of court in the northern half of England by its liability to be killed by frost in a very severe winter. Besides, it makes such a rapid and dense growth in proportion to its root development for some years that nothing but very strong staking and topping annually for five or six years will prevent it from being blown down in high and exposed situations. More commonly used is the *Cupressus Lawsoniana*, which stands well because it grows less rapidly than the *Macrocarpa*, and less densely also. Superior to any one of the three conifers named above is the *Arborvitæ*, which grows nearly as rapidly as the *Macrocarpa*, is even more dense in foliage, stands well, and is more hardy.

An outer row of the *Arborvitæ* and an inside one of the Canadian poplar or the damson may be recommended on the side of a field particularly exposed to gales. The poplar is to be preferred to the damson, partly because it grows more rapidly, and partly on account of the latter harbouring the insect pests which attack plum trees. It is true that the damson trees yield fruit for the market; but this sells at such miserable prices whenever there is a fair crop, and it costs so much to gather, that it is hardly worth taking into account. Two rows of shelter trees and a high hedge should suffice to break the gales in the most exposed situations.

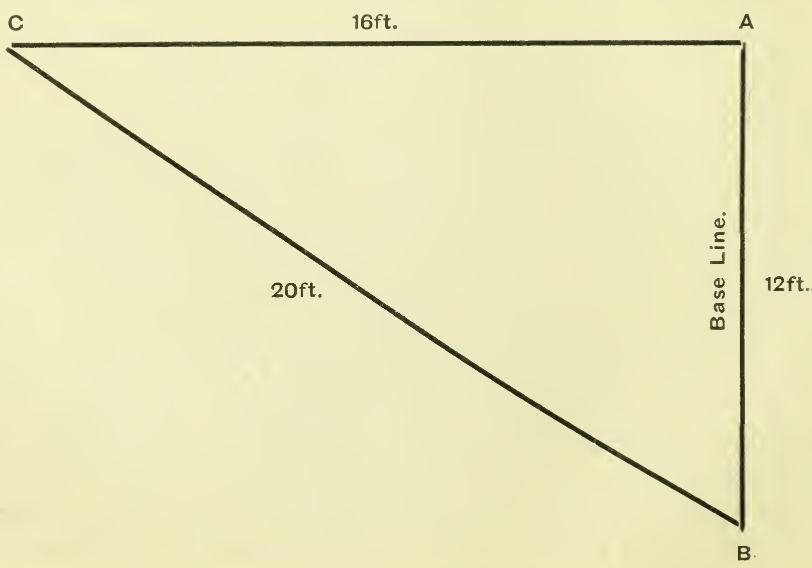
Preparing Land for Planting.

One of the many points upon which experiments in fruit growing are much needed is that of the expediency of the commonly recommended method of subsoiling land in preparation for planting fruit trees and bushes. A small trial carried out at the Woburn Experimental Fruit Farm failed to yield decisive results. A common practice is usually based on the teachings of experience; but in this case the logic of the practice is not very clear. If it be undesirable for trees to send their roots deeply into the subsoil, why should their deep rooting be facilitated by subsoiling? Deep rooting is known to promote gross growth at the expense of fruiting, and root pruning is often carried out to correct this fault. In many classes of soil, however, the trouble is rather that of insufficient growth and consequent premature fruiting. Possibly, then, subsoiling may be beneficial where growth without it would be deficient, and harmful where growth would be excessive. I have not had the courage to try planting altogether without subsoiling; but in one field subsoiled six years before some plums and apples were planted

to replace cob-nuts which were not flourishing, the trees have grown better than in any other part of the farm. The effect of the subsoiling, done by a steam cultivator at no great depth, must, it may be presumed, have been nearly obliterated in the six years. However, the flourishing growth of the trees may be due entirely to the comparatively heavy character of the soil, and not to the remoteness of the time of subsoiling.

My experience of planting in a wet season is entirely antagonistic to the Woburn doctrine of the advantage of puddling trees in by ramming wet soil over their roots. Surface rooting is generally admitted to be desirable, and this must be discouraged by planting in soil of the consistency of mud, whether produced artificially or the result of persistently rainy weather. It may be assumed, then, that fruit trees and bushes are no exceptions to the rule that crops flourish best when the land for them is prepared while it is in a fairly dry condition.

Where horse cultivation is to be pursued it is of great importance to have the rows of trees and bushes—presuming that both are to be grown in the same field—perfectly straight in two directions. A good ploughman will facilitate the accomplishment of this object by marking out the rows with a ridging plough, without the breasts, much more satisfactorily than it can be attained by sighting and measuring with a tape or line. The first row in each direction must be denoted by setting up straight sticks or canes, and sighting them carefully. Along this line the plough is driven, while a marker attached to it marks the line for the plough to follow in returning to the starting side of the field, and so on until the operation is



completed in one direction. For the crossing marks at right angles to those up and down the field the process has to be repeated.

A very simple method of getting a line made precisely at right angles to the base line may be described as possibly useful to those who are not acquainted with it.

These measurements are the greatest that a 50ft. measuring tape will cover in the way most easy for using it. Fix the end of the tape at A, and measure off 12ft. to B. Pass the tape round a cane at B, and carry it on 20ft. more to a point which will be 16ft. from A as well as 20ft. from B. That point will be C, and the line A C will be at right angles to the base line A B. It can be extended across the whole width of the field by sighting, as in the case of the base line.

The intersections of the transverse marks made by the plough will be the places for the trees and bushes. To allow of horse cultivation being carried on for some years, the distance of a bush from another bush or a tree must not be less than 6ft. The distance of the trees from each other will depend upon whether they are dwarfs, half-standards, or standards. If horse cultivation is to be pursued, the distances cannot be varied for trees of vigorous or feeble growth respectively when several varieties are to be planted in the same field. Therefore the distance of one tree from another must be a multiple of 6ft., and for trees of bush shape, where the soil is not very rich, 12ft. will be sufficient, if the more vigorous growers are on the Paradise stock. The trees can be angled, so that a tree in one row is opposite to a bush in the next row of trees and bushes, and then the distance will be a little over 12ft. from a tree in one row to a tree in the next row, although no more from tree to tree in each row. The markers on the plough, then, will be set to mark lines 6ft. apart in each direction.

In referring to trees of bush shape it is important to notice that, to allow of horse cultivation between them for as many years as possible after the planting, they should be trained on stems about 3ft. high, instead of being trained to branch out close to the ground. In that case they will require staking, and the stakes may be driven in at the intersecting points in the marks before the holes are dug, the digging being done around the stakes immediately before the trees are put in. Growers are often advised to dig the holes beforehand; but this is a bad plan, as they get filled with water in the event of a heavy rain occurring between the digging and the planting.

In placing the stakes, which will be in alternate rows, the intermediate rows being for bushes only, it is, as already indicated, of

some importance to place them so that a tree in one row will not be opposite to one in the next tree row. There will be, of course, a bush between each two trees.

Selecting Varieties.

The choice among varieties of apples is an extremely wide one, and it should be determined in part by observation or information as to those which have been found to succeed in the district where the planting is to be done. Other points are arrangements as to a succession of apples for the market, from some of the early, mid-season and late varieties. In beginning the enterprise of fruit growing it is desirable, after choosing the bulk of the trees from varieties known to flourish in the district, to plant a few trial rows or half-rows of other kinds. So far as concerns lessons from personal experience, it is not desirable to lay stress upon them for the guidance of planters generally, because varieties which fail in one particular class of soil may succeed thoroughly in another. Still, there are certain warnings which are generally applicable. Feeble growers should not be planted on poor soil, unless they are to be profusely and frequently manured. Among cooking apples Stirling Castle, Frogmore Prolific, and Golden Spire may be named as examples. An exception may be made in the case of Lane's Prince Albert, which, although a feeble grower, is such a fine apple that no market grower can be advised to exclude it. If planted in a poor soil, however, it should be liberally manured. Stirling Castle has the additional disadvantage of liability to canker, and this, together with its propensity to "fruit itself to death," should, in my opinion, exclude it from varieties to be planted for market purposes. Frogmore Prolific is too small to be worth growing for market, and Golden Spire, a tremendous cropper in alternate seasons only, is not a good market apple, as it is conical in shape and not big enough. Potts's Seedling is a very fine apple which should be excluded on account of its extreme liability to canker. Three excellent cooking apples which fail to produce fruit of full size on my farm are Wellington, Bismarck, and Newton Wonder; but they do well on soils that suit them.

Perhaps the most important suggestion to make in reference to the choice of cooking apples is to select only those which usually grow to a large size. In my experience these include Warner's King, Bramley's Seedling, Queen, Lord Derby, Gascoigne's Scarlet, Domino, and Royal Jubilee; but there are many others quite as large as the first four, and larger than the last three. The seven

named are all vigorous growers. In a good apple season the markets are glutted with fruit of medium and small sizes, and it is only large culinary fruit which yields a remunerative return.

In the case of dessert apples great size is a disadvantage, and for that reason Blenheim Orange and Peasgood's Nonsuch sell at lower prices than most other dessert varieties. Probably more disappointment has been caused by attempts to grow the best of all dessert apples, Cox's Orange, than in the case of any other variety. It succeeds only in soils which are peculiarly favourable to it, and should not be planted extensively anywhere until a trial on a small scale has proved that it will flourish. Allington Pippin is a poor substitute for it, but is a good grower and a great bearer. Charles Ross, a comparatively new variety and one of the slowest of apples in coming into bearing, appears to need as rich a soil as Cox's Orange to make it grow robustly. Being a fine apple, and a half-bred Cox, like Allington, it may prove a profitable dessert variety in the long run. Ribstone Pippin and King of the Pippins, in my opinion, should be excluded from the list of dessert apples recommended to market growers, in consequence of their extreme liability to canker. Mr. Gladstone is a useful early dessert apple to grow in soils rich enough to stimulate its naturally feeble growth. Irish Peach is objectionable in consequence of its fruiting mainly at the ends of long and pendulous branches, which makes it difficult to prune properly without cutting off the chief fruiting portions of the tree. Worcester Pearmain, Red Reinette, Beauty of Bath, Lady Sudeley, and James Grieve appear to be among the dessert varieties which flourish in most parts of the country. Claygate Pearmain might be included, but for its liability to canker.

Pears are too uncertain as croppers in our climate to be recommended for planting on a large scale for market. Moreover, the variation in the quality of different kinds in relation to locality is too intricate to allow of general recommendations in the choice among them.

Of plums no more need be said than that the earliest and the latest are most remunerative, because when the profusely productive Victoria and Pershore Egg plums are ripe the markets are usually glutted.

Gooseberries have sold so badly in recent years that there must be an excessive acreage of them in the country. The great point is to plant only those varieties, such as May Duke and Victoria, which come to a saleable size very early in the season.

Red currants have never attracted me, as they yield less and

make much lower prices than blacks. The best black currant to grow is the Boskoop. By the way, planters should refuse to buy black currant bushes with stems. Why nurserymen persist in growing them in that form it is difficult to imagine. It is quite right for red currants; but with blacks the more sucker growth is made the better is the refurnishing of the bushes with new wood, upon which the fruit is chiefly borne.

My experience does not cover the growing of strawberries or raspberries for market. It should be attempted on a large scale only where pickers can be obtained in abundance, and these branches of fruit-growing enterprise need no stimulation, as they appear to be overdone already. In some seasons, however, they have been highly profitable.

The Choice of Stocks.

On land that is not naturally rich or in high condition from liberal manuring, it is a great mistake to plant apple trees raised on the paradise stock. Where free growth is the great consideration, there is nothing equal to the crab stock. The free stock, as distinguished from the crab, is not nearly as good, because, being produced from the pips of apples of mixed varieties, it is very unequal in growth. Yet many nurserymen raise varieties of feeble growth on the free stock. The doucin is a somewhat less strong grower than the crab, but much stronger than the paradise, and not uneven, as the free stock is. There is an object lesson on this point in one of my plantations of trees planted four years ago from last autumn. Certain varieties of apples are in rows side by side, raised respectively on the crab, the free, and the doucin stocks. Those on the crab are the largest, while those on the doucin come next in regularity of growth, those on the free stock being irregular in size. The paradise has been discarded since a first trial with it in an older plantation on a loam over a sandy subsoil. There hundreds of trees were so hopelessly dwarfed that some on the crab stock had to be substituted for them.

Beginners in fruit-growing cannot be too strongly urged to refrain from ordering any of the very cheap trees offered in advertisements. As a rule, they would not be worth planting if they could be obtained for nothing. It is a good plan to visit a reputable nursery early in the autumn, and to make a firm contract for certain lots of trees of the varieties required. If the buyer simply orders certain numbers of the varieties, without making a contract for those he sees, he may be supplied with others obtained from another nursery.

When there is time to wait for trees to grow up, an intending planter may raise his own trees after planting stocks on a well manured and chalked piece of good land. The arts of grafting and budding are easily acquired. Mr. J. Cheal's cheap handbook, "Fruit Culture," published by Bell & Sons, London, gives all the information required. One advantage is that of being able to have trees trained with the height of stem desired by cutting them a few buds above that height when they are maidens. In nurseries they are mostly trained either as bushes, branching out close to the ground, or as half-standards or standards with stems higher than 3ft. Or if they are grown as feathered half-standards, the growths showing at the age of two years are not as satisfactory as they would be if all competing with those required had been trimmed off.

Manuring when Planting.

The usual advice of writers on fruit-growing is to plant after a crop that has been manured, but not to give manure to the young trees in the first instance. For feeble growers, however, a little well-rotted manure, that of the cow or the pig for choice, is a great help to starting them prosperously. It is best applied after the roots have been partially covered with earth, and before the covering is completed.

Firm Planting.

While the soil over the roots of trees should be well consolidated in planting, the usual treading appears to be sufficient. In the plantation referred to above there is one row of trees which were rammed, after the Woburn method, except that the soil was not wet enough to puddle, as I should not think of planting in wet soil. The trees have grown as well as any, but not better than those which had the soil over their roots simply trodden.

Leaving Roadways.

There is great convenience in leaving roadways at intervals in fruit plantations. A good plan where trees and bushes are grown together is to omit planting each tenth row, which may be arranged to be a row where bushes only would be planted. Such roadways are very convenient, and a great saving of expense, when farmyard or other bulky manure has to be applied, as it can be distributed by the fork directly from the carts, instead of having to be laboriously carried in receptacles by hand or wheeled in barrows from the headlands all over the field. They are also convenient for spraying when a sprayer other than a knapsack is used, and for carting fruit off the field.

Wire Netting.

The necessity of protecting young apple trees from damage by ground game is commonly recognised. In the case of trees of bush shape, branching out from close to the ground, the only plan is to place wire netting all round the plantation. The netting must be 6ft. wide with one foot bent outwards towards the hedges, and pegged down flat on the ground, to prevent rabbits from burrowing under it. Stout and high stakes are required to which the netting is to be tied. The expense is considerable, but this can be greatly reduced where the trees have stems, around which and their stakes a circle of netting of 1 inch mesh can be placed. Under the impression that hares, and possibly rabbits also, could reach up and gnaw the bark off trees at a height of 2ft., my first trial was with netting 2½ft. wide. This proved a nuisance, as many trees branched out at that distance from the ground, and in their case the netting could not be shifted up to cut off a shoot growing out of the trunk of a tree inside the circle of netting. Next a width of 2ft. was tried, and no damage was done by ground game. The conclusion then was that neither hares nor rabbits will stand on their hind legs, with their front feet on the netting, to gnaw trees above the top of it. Therefore the width on the third occasion of purchasing was reduced to 18 inches, making the expense very small. The netting is cut into lengths of 18 inches, the cut sides being twisted slightly into each other near the top, in the middle, and near the bottom. The expense, even where there are 300 trees to the acre, is very much less than that of netting all round the field, and the security is greater. In the case of plum trees there is much less danger of damage from ground game; nevertheless, rabbits will attack them in a severe winter. They even try black currants, but appear to dislike the flavour, as they do not persist in attacks upon them, and in my experience they do not interfere with gooseberry bushes materially.

Staking.

A great amount of damage to young trees is often done through the use of stakes long enough to reach up to the branching portions of the trees. When the wind blows strongly, one or more of the branches may be chafed repeatedly against the top of the stake until partially severed, and thus permanently weakened. The stake should not be higher above the ground level than the height of the stem free from branches. Even so, it is desirable to pare off slightly the sharp edges of the top of the stakes, as these sometimes cut into the trunks after the wisps of straw used when

tying have rotted or dropped out. Where the top of a stake curves, the tree should be tied to the convex side of it, and any projecting knot or portion of what was a side shoot in a stake which can touch the stem of the tree should be pared off. Canker often sets in where wounds are made by stakes in the trunks or branches of trees.

CUTTING-BACK AFTER PLANTING.

A trial on a small scale of the plan recommended by some writers of deferring the cutting-back of apple trees until the second season after planting was sufficient to prove its objectionableness. The result was the premature formation of fruit buds on the young branches, which, therefore, had to be cut back nearly to the stems to find wood buds. Those cut back in the first season, either immediately after planting or just as the buds began to swell in the following spring, had branched out considerably in the second season, when the trees alluded to above had only their original branches, which had to be cut nearly all away to get down to good wood buds.

Some of the best experts advise that the cutting-back of trees should be done just before the buds burst in the spring, rather than immediately after planting, but in the same season. The reason given is that the most vigorous buds for starting extension growth can be more certainly selected at that time than in the autumn or winter. Probably another and more important point in favour of the spring operation is that, when the sap is not rising, the wounds made in pruning do not "callose" over at once, and the frosts of winter penetrate the cut surface to some extent; whereas, when the sap is rising the healing of the wounds is speedy, and the new shoots start speedily from the buds left to develop them. Whatever the explanation may be, one of my young plantations of apple trees cut back just after planting did not start nearly as vigorously as one adjoining it treated in the spring just before the buds burst.

PREVENTING PREMATURE FRUITING.

Nothing dwarfs a young tree more permanently than premature fruiting. An apple tree two years old on being planted should not be allowed to fruit at all for two years after the planting, and only a few fruits near the trunk should be allowed to mature in the third season, unless the trees are remarkably well grown. The great object in the early years is to get a tree well furnished with sturdy branches. Until that object has been secured, the blossoms

should be picked off. It may be that where trees tend to grow rampantly earlier fruiting may be allowed with safety on trees of a vigorous habit of growth; but my experience supports the views stated above, and it has been gained at the expense of much permanent dwarfing of trees through premature fruiting.

The case is similar with pears on the quince stock, and particularly with feeble growers and great fruiters, such as Louise Bonne of Jersey. Generally, however, pears do not crop regularly enough to dwarf themselves by excessive fruiting.

Exceptions to the rule as to the prevention of very early fruiting must be made in the cases of Cordon apples and pears, which cannot get into the fruiting habit too early.

It is also to be remarked that premature fruiting may be prevented to a considerable extent by pruning or heavily manuring feeble growers in their early stages, as well as by taking care to plant trees which are on the crab stock.

Plums on soils suited to them are less liable to dwarf themselves by premature fruiting than apples are, provided that they are cut back sufficiently after planting and moderately pruned later on.

Excessive Delay in Fruiting.

In making the preceding remarks the fact that there are often complaints of apple and other trees making wood too rampantly, and not cropping for many years after the planting, has not been ignored. But this fault is often due to excessive pruning, or to planting very free growers raised on the wrong stock, or to excessive manuring. It applies more commonly to trees grown in private gardens or orchards, where the soil is very rich, and severe pruning, after the common custom of private gardeners, is pursued, than it does to trees in commercial plantations. Even such great wood makers as Blenheim Orange and Warner's King, if raised on the paradise stock, and allowed free extension as soon as they are fairly furnished with branches, will usually fruit four or five years after planting, and when once they begin, they are more regular croppers than the majority of apples. Root-pruning, as a remedy for delay in fruiting, is seldom necessary in market plantations, and fortunately, as it would be a tremendous and costly undertaking.

Thinning Fruit.

This is one of the most neglected of desirable operations on a fruit farm. It involves an immense amount of labour, and, in the

case of apples, there is no immediate return. But, as one large culinary or sufficiently large dessert apple is worth three or four undersized fruits, and the strain upon the vigour of trees burdened with great crops of inferior produce is extremely harmful to them, there is no doubt that the expense is a highly profitable investment. To thin apples properly, the operation needs to be done twice, at least in the case of varieties which bear fruit in great clusters. Such clusters need to be thinned when their fruit is quite small, and at that time it is often impossible to tell which to leave to the best advantage, besides which there is always the danger of very small apples being spoilt by certain varieties of caterpillars, and if only one be left out of a cluster, it may happen to be rendered worthless. On the other hand, if half the embryo apples in a cluster are picked off in the first thinning, the final operation can be left till the apples are sufficiently grown to show which are best worth leaving, and until the danger of surface gnawing by caterpillars is past.

In the case of culinary apples, trials seem to indicate that only one of a cluster should be left at the final thinning. This may seem a very severe measure, as two or three fruits of fair size are often matured together. But the extra value of very large cooking apples is sufficient to justify unmerciful thinning. Probably the same severity of thinning would also pay in the case of those varieties of dessert apples which never grow too large, for of only a few sorts can it be said that any but the finest make the top price.

To say nothing of the immense quantity of trash commonly grown where thinning is done insufficiently or not at all, it is to be observed that seconds usually make only half the price of firsts, while railway carriage is the same on a given weight of both, and commission as well, for usually it is a fixed sum per half-sieve.

Plums are more commonly thinned than apples when the crop is a heavy one, the work being left till the fruit is big enough to be sold in a green state. The green plums usually make a good deal more than the cost of picking them, while the remainder grow finer than the whole would have grown, and much breaking of branches is prevented. Gooseberries are commonly thinned by being picked by instalments, the largest first for early marketing.

Pruning.

There is no doubt that summer pruning, when judiciously done, promotes fruiting, though more, perhaps, by keeping the interior of a tree open to air and sunshine than as the direct result of spurring. Unfortunately, the work has to be done in the busiest

season of the year for market growers, when all hands are engaged in the gathering and packing of fruit. For this reason it is too generally neglected on large fruit farms. It can be only entrusted safely to a skilled man who thoroughly understands the principles of the system, as more harm than good is done by injudicious summer pruning. In the course of the operation, many side shoots require to be cut out entirely, close to the branches, and some amount of disbudding is beneficial.

In the winter pruning of young trees, a happy medium between the very severe cutting-back, commonly pursued by private or jobbing gardeners, and the extension system run mad, is the chief desideratum. Feeble branches can hardly be cut back too severely; but when a tree is well furnished with sturdy branches, it may be left alone, except for cutting off closely those which would crowd the interior, removing crossing branches, shortening any which are growing out of proportion to the length of the others, pruning to buds pointing in the right directions those which are growing otherwise, and spurring or cutting off entirely superfluous side shoots.

Different varieties of apple trees require different pruning, and it is only a man who is well acquainted with their special habits of growth who can deal with them properly. The only general rule is to cut just above a bud pointing in the direction in which extension is desirable. With an upright grower this is generally outwards, whereas, in the case of a variety of a sprawling or pendulous tendency, pruning to a bud pointing upwards is often desirable. This is likewise applicable to plum trees of different habits of growth. Similarly, many of the laterals on varieties of compact growth need to be cut off cleanly, while most of those on a variety of sprawling habit may be spurred to produce fruit buds, where this has not been done by summer pruning.

Extra severity in the pruning of young trees is often rendered desirable by the damage done to the shoots by the aphis. After a bad attack many young branches are twisted and covered with unhealthy fruit buds to the extent of half or even more of the length of the past season's growth. In such a case cutting back to sound wood is of importance to the symmetrical shaping and vigorous extension of the young tree.

With mature trees the custom is to do little more than removing crossing or crowding shoots; but in many cases the pruning of feeble new growths is advantageous, as well as the stopping of central growths which are absorbing sap at the expense of the side branches.

MANURING.

After fruit trees and bushes have come into bearing freely they can hardly be too heavily manured, as there is then no danger of an excess of wood growth. Nothing appears to be as beneficial as well rotted farmyard or town manure, that of cattle or pigs being preferable at any rate on other than heavy soils. Shoddy and other organic manures which are by-products of manufactures are used to a considerable extent by fruit-growers; but their manurial constituents vary greatly, and often it is doubtful whether they are worth their cost. For soils not containing an abundance of lime, liming or chalking, though it is of great importance, is too commonly neglected. The best method of supplying the deficiency is to chalk the land thoroughly before planting it, applying at least ten tons per acre. This can be done after planting, though at greater expense in distribution. Where roadways are left, as suggested in remarks on planting, the extra expense of distribution is not a great one; but it is substantial when the chalk has to be unloaded on the headlands and barrowed all over the field. At some lime works, if not at all, small chalk can be obtained for nothing, as it is refuse, and its removal is regarded as an advantage. Another way of chalking established plantations is that of sowing ground chalk by hand occasionally. If a ton to the acre be applied, it will be effective for two or three years, or possibly longer. There is no advantage in using the much more expensive lime, as this reverts to the condition of chalk after having lain a day or two on the surface of the land.

Experiments carried out by Dr. Dyer and Mr. Shrivell, at Hadlow, in Kent, indicate that a light dressing of farmyard manure with artificial manures containing nitrogen, phosphate, and potash is as effectual as a heavy dressing of the natural manure alone for apples and plums, but not for gooseberries or currants. The importance of potash, even where a light dressing of farmyard manure is used annually, is clearly shown by the appearance of the bushes, and probably would be indicated equally by the apple and plum trees, if the manuring, begun before they were old enough to have growth checked by fruiting, had not made them too gross in wood production.

There is a great need of systematic and continuous experiments, other than those carried out on a small scale at Hadlow and at Woburn, in the manuring of fruit trees and bushes. Trees and bushes are slow in showing the effect of manures, and their individual differences in vigour and growth are so great that comparative

results are often difficult to obtain. But if carried out on a sufficiently extensive scale and for a sufficient number of years, it is probable that such trials would teach valuable lessons. Where the same dressings of artificial manures have been applied annually to the same plots at Hadlow for several years the benefit is obvious. My own experiments on a small scale have not been carried out long enough to show decisive results, except that they have convinced me that the dressing, where artificials only are used, should be both complete and abundant. Where sufficient farmyard manure is not obtainable, a mixture containing 3 cwts. of sulphate of ammonia, 6 cwts. of superphosphate, and 2 cwts. of sulphate or muriate of potash per acre, may be suggested for plantations of trees and bushes, to be applied annually after they have come into full bearing.

Spraying.

The season of spraying may be said to begin with an application to gooseberries and plums as soon as birds have begun to denude them of buds, which may happen at any time after Christmas, or earlier when severe weather occurs. In some winters the birds, for some unknown reason, leave the bushes and trees alone. It is necessary, however, to be prepared to spray immediately after an attack has been begun, as an immense amount of damage may be done in a day or two. Many trials have convinced me that for preserving buds from bird attack the best wash known at present is one consisting of 30 lbs. each of quicklime and flowers of sulphur to 100 gallons of water, sprayed freely over the bushes or trees. This also acts as an ordinary winter wash for cleansing the stems and branches of moss and lichen, and for destroying any hybernating insects that may be exposed to it. The ingredients combine best when boiled together; but what is called a self-boiled mixture answers well enough. This is made by either sprinkling the flowers of sulphur over the lime while the latter is slaking, or by beating the sulphur first into a stiff paste, to get out the lumps, diluting it, and pouring the dilution over the lime to slake the latter. Under either plan the boiling action of the lime, if it be quite fresh, will cause a sufficient combination of the two materials. While the slaking is going on the mixture should be well stirred, then diluted slightly, and left covered over with sacking for about half an hour, and well stirred again afterwards. The mixture, a little more diluted, must be passed through a sieve of brass wire gauze before the whole of the water is added. No more water than

is necessary to slake the lime in the first instance, or to allow of the stirring of the mixture afterwards, should be used.*

This mixture, with the addition of 12 lbs. of caustic potash, to be added after the boiling action of the lime is finished, so as to cause renewed boiling, is an excellent winter wash for apple trees, to be applied in February. Whatever may be said against its power of destroying the eggs of insects, the absence of an attack of the apple sucker in seasons following its use, where a bad attack had occurred in a previous year, may be mentioned as entitled to some consideration, although the evidence of cause and effect is not certain, and could be rendered so only by repeated trials in more than one plantation.

The lime and sulphur wash effectually protects buds from bird attack so long as it adheres to the trees and bushes; but the application has to be repeated if heavy rain washes off the mixture. Various glutinous additions have been tried, as well as one of paraffin, to render adherence more perfect, but without avail.

It is possible that this wash, if applied to plum and apple trees at the right time, may effect the very important object of killing the aphis mother-queens on plum and apple trees. Inquiry made as to the extraordinary immunity of aphis attack on a large fruit farm visited last summer, when elsewhere the attack was extremely prevalent and prolonged, led to the suggestion by the working foreman that it was possibly—he thought probably—due to the application of lime and sulphur just before the buds burst.

In the United States this wash, reduced to 20 lbs. of each ingredient to 100 gallons of water, has been tried for three years on trees in foliage with good effect. Its use on peach trees to prevent leaf curl and some other diseases has proved a complete success, as it acts as well as Bordeaux mixture, and does not scorch peach foliage, as the latter does. As a preventive of scab in apples, it has proved nearly as effective as Bordeaux mixture, again without scorching the foliage to any considerable extent, if at all. It is important to notice, however, that only the self-boiled mixture of lime and sulphur is recommended by the conductor of the experiments. When boiled over a fire, the wash is found to cause some scorching.

Scab on apples and the leaf-curling aphis on apples and plums are by far the worst pests to deal with effectually. For the former,

* Since this article was in type, Messrs. Walter Voss & Co., of Glengall Road, Millwall, London, at my suggestion, have begun to make this mixture, so that those who wish to use it may be spared the troublesome and messy work of preparing it, and at the same time may obtain a more effective combination of the two materials than can be secured by anyone who has no proper boiling plant.

there is probably nothing else equal to a dressing of 4 lbs. of sulphate of copper to 100 gallons of water just before the buds begin to burst, followed by Bordeaux mixture immediately after the blossom has fallen, and at intervals later. In the United States sprayings are continued much longer at intervals than they are in this country, where it is not usual to use Bordeaux mixture more than twice, or three times at the most. In the case of a bad attack of scab, at least four sprayings, without counting the one consisting of sulphate of copper alone, appear to be necessary, as it was noticed last season that some trees which seemed to have been successfully treated by three applications had a renewed attack, as shown by the scabby condition of the fruit as it matured. In another case, the fruit of a variety that had been rendered almost unmarketable by scab in 1908 was quite free from the disease after three sprayings with Bordeaux mixture.

The only objection to this remedy is that it often causes the scorching of the foliage and, in some instances, very serious defoliation among some varieties of apples. Some varieties may be badly scorched when others are quite unharmed. Cox's Orange is particularly sensitive to damage from Bordeaux mixture. My conclusion is that the mixture is commonly applied in too great strength, and that no more than 6 lbs. of sulphate of copper and an equal quantity of lime to 100 gallons should be applied when the foliage is tender, the maximum being 8 lbs. when the foliage is mature. Last season when the Woburn Bordeaux paste, prepared by Messrs. Walter Voss & Co., of Millwall, London, was used in strengths equivalent to that just named, no scorching took place, even in the case of Cox's Orange.

Where there is any reason to expect an attack of the larva of the codlin moth, or where leaf-eating caterpillars are present, 4 lbs. of lead arsenate paste, sold by Messrs. Voss and by Messrs. Strawson, of Queen Victoria Street, London, should be added to 100 gallons of the Bordeaux mixture for the spraying done just after the fall of the blossom, and a second time, if found necessary, as it usually is. The mixture without the arsenate of lead serves as a preventive to scab in pears.

Bordeaux mixture is also to be recommended against brown rot in apples, plums, or cherries, and in the case of plums the lead arsenate is usually needed to kill leaf-eating caterpillars. Two applications should suffice.

With respect to leaf-eating caterpillars it may be mentioned that in the case of some young apple trees great benefit resulted last season from squeezing between the finger and thumb every terminal

bunch of leaves before the opening. On some trees there was a caterpillar in nearly every terminal bunch. When the leaves have once expanded, and caterpillars are feeding upon them, it is easy enough to destroy them by poisoning their food; but last season, owing to the coldness of May, the foliage was extremely slow in expanding, and so long as the pests were feeding inside the clusters of leaves, they could not be destroyed by spraying. Of course the squeezing process is quite out of the question in the case of large trees.

The most nearly invincible of all insect pests is the leaf-curling aphis. Unless the mother-queens can be killed, spraying is almost useless, as the leaves curl over the insects immediately after they have begun their attack, and then very few of them can be reached by the wash. Some are killed; but reproduction is so exceedingly rapid with the rest that the effect is not noticeable.

For destroying aphides, the expensive nicotine wash was tried by me last season; but it did not prove any more effective than the older and much cheaper mixture of soft soap and quassia, made by boiling 10 lbs. of the soap and an equal quantity of quassia chips together for at least half an hour after the water has begun to boil, and diluting up to 100 gallons. This wash almost entirely cleared some trees of apple sucker, and it killed nearly fully grown caterpillars of the lackey moth when they were deluged with it. At the increased strength of 12 lbs. of each ingredient to 100 gallons, it destroys sawfly caterpillars on gooseberry bushes. At least, it cleared a field of badly infested bushes when it was applied on a day of hot sunshine; the caterpillars fell from the bushes, and died on the ground.

It is almost impossible to clear old apple trees of the woolly aphis —the so-called "American Blight"—when they have become badly infested, although any caustic winter wash kills colonies which it reaches. But attacks on young trees can be annihilated by the persevering use of neat methylated spirit, applied with a brush to every colony that can be detected. This spirit is more penetrating than any other remedy that has been recommended, and it does no harm to the bark.

Spraying is a great expense and an almost intolerable nuisance to fruit growers. Nevertheless, it must be carried on persistently and with good judgment, in order to secure full crops of sound fruit.

Urgent Needs.

Fruit growers badly need such information as a properly equipped horticultural division of the Board of Agriculture should be able

to supply. At present the Board has no expert in reference to either insect or fungous fruit pests, and inquiries sent on these subjects have to be transmitted to an outsider, if they relate to insects, and to Kew if they concern fungous attacks. Usually there is so much delay in getting replies that inquirers have often forgotten the circumstances and even the subjects of their inquiries.

Further, there is an urgent need of experiments and research upon very many points connected with fruit growing upon which there is no precise knowledge at present. Through the generosity of the Duke of Bedford and the energy and scientific knowledge of Mr. Spencer Pickering, much has been done in these directions; but results obtained at one station and by a single observer are not sufficient to afford conclusive evidence on many points. In consequence of the lack of exact knowledge, there is much loss in the practice of the art of fruit growing, and a great waste of money constantly occurs owing to ill-directed manuring and spraying.

IV.—SOIL BACTERIA IN RELATION TO PLANT FOOD.

By C. T. Gimingham, F.I.C. (University of Bristol).

The soil is normally the home of vast numbers of minute living organisms; and the most important of these to the agriculturist are the bacteria. It is to their activities that the many complicated chemical changes always going forward in the soil are chiefly due, and without the work of some of these micro-organisms the growth of crops under ordinary conditions of farming would become an impossibility. All plants derive an important part of their nourishment from the soil through their roots, and bacteria are intimately concerned with the maintenance of the supply of this plant food. The soil would soon become nothing more than an anchorage for the plant, were all the normal bacteria present to be destroyed.

On the other hand, certain kinds of soil bacteria act in quite another manner, and may cause a sensible loss of valuable elements of plant food.

Thus it concerns every farmer, who wishes to take advantage of all possible means for securing good crops, to have some knowledge of the conditions which facilitate or retard the activities of the soil bacteria. In point of fact, many of the operations upon the farm, the value of which was known for generations before the discovery of the existence of bacteria, receive their explanation from our

knowledge of the life and work of these minute organisms. Much of the work of old-time farmers was, unconsciously, devoted to producing those conditions of soil most favourable to the development of the useful bacteria.

It is only comparatively recently—within the last twenty or thirty years—that the study of the bacteria of the soil, both from the theoretical and practical point of view, has been taken up, and their importance in agriculture recognised. At the present time, however, a large number of workers are engaged on this subject and every year adds to our knowledge of these organisms in their relation to agricultural processes ; already bacteriological discoveries have had an important bearing on farming practice.

It was from a medical point of view that, towards the middle of last century, bacteria were first accurately investigated, and in consequence, they are still much better known in connection with disease than with agriculture. Actually, however, the number of species known to cause diseases of various kinds is comparatively small, and they occur in abundance only under certain special conditions. Some of the processes with which soil bacteria are concerned have already been investigated in considerable detail ; still, it can only be said that the whole subject of agricultural bacteriology is yet in its infancy. Under these circumstances, it is not surprising that the *practical application* of discoveries in this domain should be still in a somewhat tentative and uncertain state. It is possible to study in the laboratory, with more or less completeness, the life processes of a particular species of bacterium isolated from the soil ; but to state exactly how far the results are a true picture of the life of that organism under the complicated conditions obtaining in a normal soil, is as yet scarcely possible. Indeed, we need to acquire a much more general knowledge of the working of bacteria in the soil and particularly of their relations with one another.

Attempts at a practical application of bacteriological discoveries to agricultural processes are, however, numerous and to some extent have met with success, as will be noted later ; doubtless there will be very considerable progress in this direction in the near future.

It is attempted here to indicate some of the most important ways in which the bacteria dwelling in a cultivated soil are concerned in the supply of food to the crop and to show what influence their action may have upon farm practice.

Bacteria are the smallest of all known living organisms, and the effects they produce seem out of all proportion to their size. This is partly accounted for by their universal distribution and by their

quite extraordinary powers of rapid reproduction. Under favourable circumstances, bacteria may multiply so rapidly and in such prodigious numbers that it is not at all difficult to understand that they are capable of bringing about very great changes in the material upon which they feed.

Almost all bacteria require food of animal or vegetable origin, *i.e.*, organic matter of some sort, and they are the principal agents by which such material is broken up and destroyed. During their life-processes they cause profound chemical changes in such material; and it is not so much the organisms themselves that are important from the point of view of agriculture, but rather the changes which they produce—the *results* of bacterial activity.

BACTERIA IN SOIL.

A cultivated soil constitutes a favourable breeding-place for micro-organisms of many sorts. By the use of appropriate methods, it is possible to distinguish a very large number of types of bacteria in any soil. Some are cylindrical in form, some spherical, and others curved or spiral. Again, some possess the power of moving rapidly in the soil water, others are stationary; some require a free supply of air for their development, others can only exist in absence of air or when the supply is very limited. But more important than differences of size or shape are the very striking differences which are to be found in their actions on the various constituents of the soil, and especially on those compounds which serve as plant food.

The number of bacteria in a cultivated soil is very large and may vary from a few thousands to perhaps twenty millions per gram. Both numbers and kinds in any soil are subject to great variation, and it is important to consider briefly some of the chief factors which may be responsible for this.

Climatic conditions have a great influence. A sufficient degree of *warmth* and *moisture* is essential for their growth. It is true that low temperatures or complete drying up do not necessarily cause the destruction of bacteria, but, for the time being, their activities are entirely suspended.

The *mechanical or physical condition of the soil* is another point of much importance. The predominant types of bacteria in a loose sand will be different from those in a heavy close-grained clay. The proportion of those kinds which flourish when the supply of air is very limited will naturally be more numerous in the clay, though even in the heaviest clay soil air-needing forms can always be found.

Naturally, too, the *quantity and quality of the material available as food* for these organisms has an important share in determining their number and what will be the most numerous types. In a dry sandy soil, poor in organic matter, there will be found comparatively few bacteria, whereas a rich loamy soil may show vast numbers.

Other important factors which may have much influence are the *nature of the crop*, the various operations of *tillage* and the *manuring*.

As regards the distribution of bacteria in the soil, the main point to be noted is that they are present in greatest numbers a few inches below the surface, rapidly getting fewer as the depth increases. The usual infertility of sub-soil when brought to the surface can be at all events partly explained by the lack of a sufficient number of bacteria to carry forward, fast enough, the changes necessary for the production of plant food.

BACTERIA AND SOIL HUMUS.

The processes of decay and putrefaction though for long thought to be chemical in nature, are now well known to be of biological origin. They are the work of micro-organisms.

In the soil, the organic matter (animal and vegetable residues, organic manures, etc.), undergoes decay, and is rapidly changed under the influence of the soil bacteria. This organic matter (when partially decayed known as *humus*) is the source whence nearly all soil bacteria derive their food supply. Now, humus always contains a proportion of carbon and nitrogen—two of the essential elements of plant food—which are, however, combined there in such a form as to be useless to the plant. The chief work of soil bacteria may be said to be the breaking down of such insoluble substances into a condition in which they can be directly utilised by plants as food. The plant food in green manures, roots, stubble, etc., can only become available to the crop through the intervention of soil bacteria, and if these were destroyed and the processes of decay in the soil stopped, it would soon be found impossible to obtain a crop.

The composition of humus is not constant: it is a mixture of various more or less complicated bodies, which differ in the degree of resistance which they offer to the action of bacteria. The rate of decay of this material will depend largely on the nature of the soil. Thus in some soils which are loose in texture and well supplied with air, organic materials decay very rapidly indeed, and the farmer has difficulty in keeping up a sufficient supply of humus; soils of this type respond quickly to applications of manure. On the other hand, a too close-textured soil will be liable to accumulate

humus unduly, and if it should become water-logged will give rise to deposits of a peaty nature ; it becomes necessary then to attempt to increase the number and activity of the bacteria by drainage, liming and cultivation in order to cause the desired changes to go forward.

The fate of the *carbon* in the organic matter of the soil first needs to be considered. Under the action of certain bacteria, the carbon becomes converted into carbon dioxide (carbonic acid gas) which finds its way into the air. In very compact soils or in swampy land, where air is largely excluded, this action proceeds but slowly : in presence of abundance of air, as in most arable soils, it is more rapid, most of the carbon being set free as carbon dioxide. All green plants obtain their carbon by assimilation of carbon dioxide through their leaves and the amount escaping into the air from the soil in this way goes to increase the available stock. Indirectly, therefore, soil bacteria assist in the supply of carbon to the plant.

It is, however, with the *nitrogen* that we are chiefly concerned. As has been mentioned, nitrogen is essential to plant growth—indeed, it is essential to life in any form—and the supply of nitrogen to the plant is perhaps the most important of the farmer's problems.

Furthermore, about 80 per cent. of the air with which we are surrounded consists of nitrogen : but plants, with the exception of one family (the Leguminosæ) are quite unable to make use of this vast stock. Nitrogen must be in a state of combination with other elements in order to become available as food.

Most of the combined nitrogen in the soil is originally contained in the organic matter, which therefore is the main source of nitrogen to the plant, and the life-processes of various bacteria are responsible for the conversion of this organic nitrogen, which cannot be used by the plant, into a condition in which it becomes available.

Speaking generally, the three chief states of combination in which nitrogen may be present in the soil (whether naturally, from the decay of animal or vegetable matter, or artificially by the introduction of manures), are (1) as organic nitrogen, (*e.g.*, in natural humus or in rape cake, shoddy, etc.) ; (2) as ammonium salts (*e.g.*, in sulphate of ammonia) ; (3) as nitrates (*e.g.*, in nitrate of soda or nitrate of lime). Only in the latter condition, *i.e.*, in the form of nitrates, is nitrogen taken up by the roots of plants as food to any considerable extent under normal conditions.* Nitrogen finding its way into the soil in any other form than as nitrates has to undergo

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* Certain other compounds are directly assimilable by plants, but nitrates are the normal and usual source of nitrogen. (See also note at end.)

change before it can become of actual use as plant food. It is the work of certain of the soil bacteria which brings about these changes. Even in a soil plentifully supplied with humus rich in nitrogen, seedlings would die of nitrogen starvation, were all the bacteria to be killed off.

Let us consider what happens to the nitrogen contained in the organic material in the soil—say, for example, the stubble of a previous crop when it is ploughed in—before it can become available as plant food. No single kind of bacterium has the power of converting organically-combined nitrogen directly into the form of nitrates, but the process takes place in several stages, each stage being the work of independent species.

PRODUCTION OF AMMONIA IN SOIL.

The first step in the decomposition of organic nitrogenous matter involves the conversion of a part of the nitrogen into ammonia. This process—decay or putrefaction, as it is termed—is one of simplification: the very complicated substances of vegetable or animal origin are broken down to various simpler compounds and much of the contained nitrogen becomes *ammonia*, which is retained in the soil. This production of ammonia is an essential stage in the transformation of organic nitrogen into nitrates.

It was at one time thought that all such decomposition was the work of one kind of bacterium, and *Bacterium Termo* was the name given to it. Now, however, a large number of decay or decomposition bacteria are known: some are most abundant under one set of conditions and others under another set. Some develop only with a free supply of air: others require absence of air; and it is the work of these last which may, on occasion, produce poisonous bodies as by-products. The important point is that decay bacteria are to be found practically everywhere—in air, in water, and abundantly in soil. They will at once utilise any portion of dead organic matter, animal or vegetable, and, provided sufficient moisture is present, will multiply rapidly in it. The material is used as food and the organisms continue to increase until the supply gives out, when they must lie dormant till more is available.

The precise nature of the decomposition changes will vary in different soils, and with the particular species of bacterium which predominates. Some are capable of converting a large percentage of the nitrogen in organic compounds into ammonia; others are much less active in this respect. A well-known type—*Bacillus mycoides*—is among the most powerful ammonia producers, and is one of the most abundant of the decay bacteria.

Realising the essential nature of the work of these organisms, it is important to know the conditions of soil most favourable to their development. Sufficient moisture, a certain degree of warmth and the presence of mineral food are necessary, as indeed they are for all bacterial growth. Further, there must be a supply of lime or chalk in the soil to prevent any accumulation of acid by neutralising it: for acid is fatal to most of the vigorous kinds of decay bacteria. Good cultivation, causing air to circulate freely, hastens the breaking down of organic material, though in some loose, sandy soils it is difficult to prevent the process going too fast.

Decay bacteria invariably attack first the most easily decomposable substances: therefore, in most soils there is a tendency for the nitrogen to accumulate in substances which are resistant to attack. Following on the discovery of the varying powers of ammonia production possessed by different species of bacteria, attempts were made to introduce new and very active strains into a soil, so as to break up the resistant compounds more rapidly. A material called "alinit" was placed on the market some years ago, which consisted of a culture of some such very active organism. It did not, however, meet with any great practical success and its use has since been abandoned.

To find a means of unlocking and rendering available the nitrogen which thus lies dormant in those compounds which offer a great resistance to the action of the decay bacteria, is an important practical problem yet to be solved.

NITRIFICATION.

The further steps in the transformation of organic nitrogen into a form utilisable by plants are two in number—first, the conversion of ammonia (produced by the process just described) into compounds known as *nitrites*, and finally the change of nitrites into *nitrates*. These two processes, though quite distinct and the work of independent bacteria, are known together under the name of *nitrification*.

Nitrification was originally thought to be a purely chemical process. In 1877, however, its bacterial origin was demonstrated, but it was not till about 1890 that the actual species of bacteria concerned were thoroughly investigated. The isolation and study of the nitrifying bacteria involved a great amount of patient research work, for it was found that the ordinary methods of bacteriological technique could not be employed. However, the difficulties were at length overcome, due in the first place to the labours of Warington

at the Rothamsted Experiment Station; and the problem was finally completely cleared up by the work of Winogradski, a Russian scientist. He proved:—(1) That organisms now known as the *Nitrous Bacteria* perform the conversion of ammonia compounds into nitrites and are not able to carry the process further: of these, at least two species have been distinguished, one inhabiting the soils of the Old World and the other those of America and Australia; (2) That the further conversion of nitrites into nitrates is the work of other organisms called the *Nitric Bacteria* or *Nitrobacter*.

In their mode of life, both nitrous and nitric bacteria (together termed the nitrifying organisms) differ in a very striking way, not only from other micro-organisms but from all other living things—*they require no organic food.* They are able to make use of ammonia salts (or nitrites) as a source of nitrogen, and if supplied, in addition, with small quantities of mineral salts, they can grow and increase in the absence of any trace of organic material. Further than this, the presence of soluble organic matter, even in small quantity, is directly harmful to their development. It was these properties, up to that time quite unknown among living organisms, which made the isolation of these bacteria a matter of such difficulty.

The practical importance of the process of nitrification is very great. It is true that some plants are able to make use of ammonium salts as a source of nitrogen, but under normal conditions it is in the form of nitrates that most of the farm crops obtain their supply of this element.* Where soil conditions are reasonably favourable, ammonium salts are nitrified with great rapidity: sulphate of ammonia applied as manure thus becomes available to the crop very quickly.

So far then as we have gone in considering the fate of the organic nitrogen in the soil, we have these changes:—

1.—The production of ammonia from the nitrogen of organic compounds under the influence of the decomposition bacteria.
2.—The conversion of ammonia compounds into nitrites by the nitrous bacteria.
3.—The conversion of nitrites into nitrates by the nitric bacteria, the two latter processes constituting "nitrification."

The question of importance to the practical agriculturist is this. What are the conditions of soil under which these actions proceed so as to benefit the crop to the greatest extent?

As regards the work of the decay bacteria, the most favourable

* See note at end.

conditions have been mentioned on p. 57, and these in the main are also satisfactory in promoting nitrification. Of the utmost importance is a thorough aëration of the soil. Nitrifying bacteria require an abundant supply of air for the development of their activities: given a suitable temperature, then repeated cultivation and stirring of the surface soil result in a rapid production of nitrates. This is one of the principal objects in view when land is left fallow for a season. Besides making it more easy to obtain a satisfactory tilth, the continued cultivation to which the land is subjected promotes nitrification and the accumulation of nitrate. The nitrate thus formed is available for the following crop, though, if the autumn rainfall is very heavy, there is danger of a good deal of it being washed away.

The difference between the usual manuring of wheat and of barley illustrates the influence of temperature and aeration on the rate of nitrification in a normal soil.* In the case of wheat there is usually little cultivation of the soil after the seed is sown in the autumn and the main growth of the crop takes place in the early part of the year when the temperature is low and nitrification consequently feeble. Therefore in the Spring the wheat crop usually receives and responds to a dressing of easily available nitrogenous manure. Barley, on the other hand, is generally grown without nitrogenous manure, the nitrification of the organic nitrogen being sufficiently rapid to supply the crop with nitrates. This is to be explained by the fact that the land has received a comparatively late cultivation, while the chief growth of barley is at a later period of the year than that of wheat, when the temperature is higher and nitrification more rapid.

The presence of a supply of chalk in the soil, to act as a base, is another of the essentials for active nitrification. It is required to neutralise the acids which are produced during the process: in the absence of a base, the accumulation of acid would rapidly put a stop to the activities of the organisms.

An interesting example of this effect is to be found in the grass plots at Rothamsted. Some of these plots have become acid through the long-continued use of large quantities of ammonium salts as manure. The result is that nitrification has been brought almost entirely to a standstill (the normal types of bacteria being largely replaced by moulds, etc.), with consequent deterioration of the herbage, which is reduced to a growth consisting almost entirely

* See "Fertilisers and Manures," by A. D. Hall, F.R.S. (Murray, 1909.)

of three rank species of grass. These are making use of the ammonium salts direct (without conversion into nitrates) as a source of nitrogen.*

DE-NITRIFICATION.

Among organisms which come under the heading of decomposition, bacteria are some whose activities at times result in a *loss* of nitrogen to the soil. Instead of converting the nitrogen of the organic matter into ammonia, they carry the process further and nitrogen gas is liberated. This passes into the air and is lost. Others again decompose the nitrates, setting free nitrogen. These processes are known as *denitrification.* Denitrifying organisms are of many kinds, and abundant in soil, manure, etc. It is, however, only under exceptional circumstances that there is likely to be a serious loss of nitrogen to the soil from their action. For denitrification to go forward actively there must be very large amounts of soluble organic matter available, and so the action will not proceed unless the land is in exceptionally high condition. Many experiments have shown that it is uneconomical to use *large* amounts of nitrate of soda in conjunction with large amounts of fresh dung, for the reason that under such conditions the denitrifying bacteria are active and cause the decomposition of some of the nitrate of soda with loss of its nitrogen. In these experiments, however, excessive amounts of the manures were used and in ordinary farming practice there is probably little likelihood of any very serious loss from denitrification.

These same bacteria are the cause of the loss of nitrogen which always occurs in the making of farmyard manure.

There is another way in which a certain amount of available nitrogen is undoubtedly withdrawn (at all events temporarily) from the reach of plant roots. Certain bacteria make use of ready formed nitrates and ammonium salts as food for themselves and so compete with the crop for the supply of readily available nitrogen compounds in the soil. The nitrogen is built up by the bacteria into their own bodies and is thus no longer of use to the plant. Finally, however, when these organisms die and undergo decay, no doubt most of this nitrogen is reconverted into nitrates by the processes described above, and once more comes within reach of the

* It is, however, found that even on plot 11, the soil of which is sufficiently acid to redden litmus paper, nitrification still continues to a very slight degree. The presence of isolated particles of chalk, each serving as a centre for nitrification, is the probable explanation.

plant. There is only a temporary withdrawal of easily available nitrogen and not much actual loss. Very little is at present known as to how far this bacterial competition for the plant food may be of practical importance.

NITROGEN FIXATION.

(*a*) *By bacteria in conjunction with leguminous plants.*

Up to this point, the action of soil bacteria has been considered only in relation to the *combined* nitrogen present in the soil which the plant obtains by absorption of nitrates through its roots.

Now the air with which we are surrounded, as is well-known, consists approximately of four-fifths of this element nitrogen. This vast store of free nitrogen gas is not utilisable by most plants as food; but there is one important group, *i.e.*, the Leguminosæ (peas, beans, clovers, etc.), which are able to obtain their supply of nitrogen from the air and are not dependent on the combined nitrogen in the soil. In this respect, leguminous plants (among which are many kinds grown as field crops) differ from all others; they have a second source from whence they are able to derive a supply of nitrogen.

Before the discovery of this peculiarity of the leguminosæ, it was believed that the nitrogen in the air was of no use to any plants as food and that the nitrogen necessary to their growth could only be obtained from that present in the soil. Indeed accurate laboratory experiments seemed to render this theory incontestable. Still, in practice, there were difficulties in making it fit in with all the facts. The accumulated experience of farmers for many centuries went to show that leguminous crops actually had the power of, in some way, enriching the soil and adding nitrogen to it. Such observations eventually received their explanation by the discovery of the nitrogen-gathering power of leguminous plants.

How do the leguminous plants get this nitrogen from the air? In what respect do they differ from other groups of plants?

The answer to these questions came in 1886, and was due to the work of two German scientists. They discovered that this power of obtaining nitrogen from the air is connected with the presence of certain swellings on the roots—*nodules* as they are called. Inside the nodules are great numbers of bacteria, and it is these bacteria which actually take up the nitrogen of the air and later hand it on to the plant on which the nodule is situated. If leguminous plants are grown in such a way that these nodule bacteria are prevented

from gaining access to the roots and forming nodules, then these plants are no more able to get their nitrogen from the air than are other kinds.

The nodule bacteria living in the soil penetrate the roots of leguminous plants. Once inside, at each point where they gain an entrance, they increase in numbers and form a nodule, at first obtaining some of their food supply from the plant. Then they begin to "fix" or combine the nitrogen of the air and this is eventually absorbed into the plant tissues as food.

It is of importance to note that there appear to be a number of varieties of the nodule bacteria. Nearly each kind of leguminous plant has its own special variety: *e.g.*, the organism which forms nodules on the pea is not capable of producing nodules on lucerne. In a few cases, however, one variety of bacterium is able to form nodules on more than one kind of plant.

INOCULATION.

Having learned that the nodules are caused by bacteria and are of so much value to the plant, people began to wonder whether all soils were provided with the right kind of organism in sufficient numbers. Possibly the failure of leguminous crops might sometimes be due to lack of the right bacteria.

Accordingly experiments were started in Germany on heathy swampy land which had been reclaimed and had never borne leguminous crops. In such a soil it was hardly to be expected that the bacteria would be already present. The first method that suggested itself was to transfer to this land a small quantity of soil from a field where a good crop of the desired plant had been growing. In other words, inoculation with soil. A comparatively small amount of soil was applied with the idea that the bacteria which it contained would rapidly increase in numbers and infect the new soil. The result of this soil inoculation was very successful. The plots treated with infected soil bore an excellent crop, whereas on the plots not so treated, the plants failed. Also, the good crop showed large numbers of nodules on the roots and the other none, or very few. The conclusion is that in this newly reclaimed land the necessary bacteria were not present and they had to be introduced in order to obtain a good yield.

Following on experiments of this sort, a definite system of green manuring with leguminous plants has sprung up in Germany for the enrichment of barren light sandy soils. By the use of lime, phosphatic manures and potash, together with leguminous crops ploughed

in green, the fertility of such soils has been enormously increased without the use of other nitrogenous manure. The farmer has, in the leguminous plant, an actual means of adding nitrogen to the soil. Unfortunately the extent to which this means of enrichment can be employed is limited owing to the difficulty of growing such crops more than a few times on the same soil, except at long intervals.

It was, however, soon realised that there are serious drawbacks to the method of inoculation with soil. It is an expensive matter to transport somewhat large quantities of soil over any distance, and, what is still more important, there is the great danger of transferring objectionable weeds, fungus or insect diseases from one locality to another. To get over such difficulties, methods involving the use of *cultures* of the nodule bacteria have been introduced.

A pure culture of a bacterium is a growth of the particular organism, uncontaminated by other kinds, on some substance on which it can feed and multiply rapidly, until vast numbers are present in a small space.

Such cultures were obtained from the bacteria in the nodules on the roots of various leguminous plants, and in 1896 were placed on the market under the name of *Nitragin.* This was a German preparation; nitragin was a growth or culture of the nodule bacteria in gelatine. The material was to be mixed with lukewarm water, the seed moistened with it and then dried in a cool place before planting. The bacteria on the gelatine were thus distributed among the seeds and carried into the soil. Nitragin was extensively tested in Europe and America, but though there were some favourable reports yet the majority of the returns were negative. It was on the whole a failure.

Then the matter was taken up in the United States, where a different method of preparing the cultures was adopted. This American material at first seemed to meet with great success, particularly with certain leguminous plants which were originally introduced from Japan—soy-beans and alfalfa. The commoner crops, such as clovers, peas, beans and vetches, even on new soils, did not appear to require inoculation, showing that the necessary bacteria were nearly always present. However, it was otherwise with the introduced plants. They frequently failed to develop well and their roots were found to lack nodules. Inoculated plants, on the other hand, developed normally and produced an abundance of nodules.

Indeed, it may be stated generally, as an established fact, that inoculation with soil from an old field, or with efficient cultures of

the bacteria, is necessary, in order to obtain a good crop of any leguminous plant under either or both of the following conditions :—(1) When the soil is newly reclaimed, sandy, heathy, or swampy land, which has not carried leguminous crops ; (2) When the crop is one which is being introduced and which has not previously been grown in the district.

Under these conditions, and if the soil is supplied with sufficient available mineral plant food and lime, efficient inoculation will prove valuable.

In spite of the apparent success which attended the first distribution of the American cultures, the use of pure cultures for inoculation in the United States is still in a state of more or less uncertainty. A great many experiments turn out entirely unsatisfactory. The Department of Agriculture at Washington continues to send out large numbers of cultures to farmers, and favourable results are obtained under some conditions.

In Germany, the old preparation, which was a failure, has given place to a new one, used in a slightly different way. In the last few years many experiments with these new cultures, especially in Bavaria, seem to yield promising results, and large numbers are being used.

In this country there are also preparations of the nodule organism, for inoculating seed or soil, on the market. It is claimed for these materials that when applied to the seed of leguminous plants, or to the soil in which such plants are grown, the yield of the crop is increased. Careful experiments have, however, not always confirmed this claim. Cultures for inoculation may, perhaps, be of value under certain conditions and in certain cases, but apparently these are not the conditions that usually occur in this country. It seems that, as was to be expected, most of our soils are adequately supplied with the nodule-forming bacteria necessary for the ordinary leguminous crops.

In the uncertain state in which this matter stands at present, inoculation cannot be recommended as a general measure.

There is a further interesting point in this connection. On cultivated soils which have frequently borne leguminous crops, nodules are always formed on the roots whether the seed was previously inoculated or not. If, however, it were possible to introduce into such a soil a race of nodule bacteria having a higher power of fixing nitrogen than those already present, inoculation would prove of the utmost value. To bring about an improvement in the nitrogen-gathering power of the nodule organisms is a problem not yet satisfactorily solved.

(*b*) *By free living bacteria.*

Besides this fixation of nitrogen in association with leguminous plants, it had been noticed that soil by itself gained a small quantity of nitrogen from the air. Moreover, this gain could be stopped by sterilising the soil by heat or antiseptics. The natural inference was that this increase of nitrogen was due to the activities of minute living organisms of some kind; and in 1893 a bacterium was discovered having the power of bringing free atmospheric nitrogen into a state of combination. This organism, by name *Clostridium pasteurianum*, is, however, only capable of growth in absence of air, and though widely distributed in cultivated soils, presumably occurs for the most part in the deeper layers and will be most abundant in soils of a dense compact nature. But it was in well aerated friable soils that nitrogen-fixation was found to take place to the greatest extent, so it appeared that *Clostridium* could not be the organism principally concerned.

Then in 1901, Beyerinck, a Dutch investigator, described a bacterium isolated from the soil which be named *Azotobacter chroococcum.* This organism requires abundance of air for its development, and has a comparatively high power of nitrogen-fixation; and from much recent work on the subject it appears that its action is one of the most important causes of the increase of soil nitrogen. *Azotobacter* is a comparatively easy bacterium to identify and isolate from the soil, and since its first discovery, has been found in many soils both in Europe and America, and its power of gathering nitrogen from the air has been many times demonstrated.

This power naturally confers on *Azotobacter* a great importance from the standpoint of the agriculturist, for it is a means of adding to the fertility of the soil. The extent to which the nitrogen gathering activities of these bacteria will attain depends very considerably on the nature of the soil and other external conditions so that in any given soil its numbers may be increased or decreased by various methods of treatment.

A liberal supply of air, *i.e.*, thorough aeration of the soil, is one of the essentials for the good development of *Azotobacter.* Furthermore, a sufficient quantity of carbonaceous material is required to supply the food and energy necessary for the fixation of nitrogen. On ordinary arable land where little material containing carbohydrate is allowed to accumulate owing to the annual removal of the whole crop, there is not sufficient development of *Azotobacter* for its action to become apparent. Indeed, where no nitrogen is supplied from any outside source, as on the unmanured plots of the arable

fields at Rothamsted, there is a gradual loss of this element. On the other hand, in land laid down to grass, carbon compounds of which the *Azotobacter* can make use are continually being added to the soil, and some quantity of nitrogen is consequently fixed.

Another important point is the need of lime—calcium carbonate—which this organism shows. It does not occur at all in soils that have become acid or sour, and it is only in those containing a sufficiency of calcium carbonate that its activities are manifested.

Mr. A. D. Hall has drawn attention to a very interesting example of a definite increase in the amount of nitrogen in a soil, due to the work of these nitrogen-fixing bacteria. A part of Broadbalk wheat field at Rothamsted has not been cultivated for the last 25 years. During that time it has been covered with a natural growth of weeds which has not been cut or in any way interfered with, so that with the dying down of the vegetation each year a considerable quantity of carbonaceous material has been added to the soil. The amount of nitrogen in the soil at the beginning of the time was determined, and again at a recent date: the comparison of the two numbers shows an *increase* of nitrogen of something like 50lbs. per acre per annum.

On the unmanured plot of the same field, as noted above, there has been a *loss* of nitrogen. The difference in these two results is largely to be set down to the accumulation of carbonaceous material under the wild conditions resulting in an increase of the activities of such organisms as *Azotobacter*.

A second piece of land allowed to run wild in a similar way (part of Geescroft field, Rothamsted) shows also a gain of nitrogen; but to a considerably less extent. This is to be accounted for by the fact that in this case the land is short of calcium carbonate, and has become acid, so that although the necessary supply of food is there, the conditions are not in the same way favourable to the *Azotobacter* organisms.

Although in the laboratory it is possible to demonstrate the power of *Azotobacter* to fix a small quantity of nitrogen in pure culture, still, we do not yet know accurately what may be the extent of its work when living under natural conditions in the soil. Its relationship to other soil bacteria is a matter of importance: and indeed it appears probable that some sort of association with other species renders a greater fixation of nitrogen possible than is obtained in pure culture.

Before concluding, it is interesting to note that in all likelihood it is to the action of the nitrogen-gathering bacteria that a large part of the original stock of nitrogen in the world may be attributed.

The transformations through which nitrogen may go in its passage through the animal and vegetable kingdoms are numerous: some have been mentioned here. But, although a number of reactions are known which may cause a setting free of nitrogen gas and a consequent loss to the world's store, yet the work of nitrogen-fixing bacteria, whether in association with leguminous plants or alone, is the only natural process of any importance which adds to the stock of combined nitrogen. This process presumably has been going on for many centuries, and may reasonably account for the stock of nitrogen in a state of organic combination in the world.

An important piece of work carried out by Drs. Russell and Hutchinson at the Rothamsted Experiment Station, an account of which appears in the last number of the Journal of Agricultural Science, throws a good deal of light on some of the questions dealt with in this article. It has been found that the numbers to which the decomposition bacteria (those giving rise to ammonia) may attain in the soil is limited by the action of larger organisms,—species of Protozoa. These feed on the bacteria and so prevent their increase beyond a certain point. When a soil is *partially* sterilised by heat or volatile antiseptics, these larger organisms are killed and the surviving bacteria are then enabled to increase to much greater numbers than were originally present. This results in more plant food being rendered available and larger crops can be obtained.

Incidentally, it was found that the nitrifying bacteria were all destroyed by partial sterilisation; and since larger crops were obtained even in their absence it appears that plants are able to make use of nitrogen compounds other than nitrates as food to a greater extent than was formerly supposed. "Nitrification is shown to be economical, but not essential."

V.—KENT OR ROMNEY MARSH SHEEP.

By W. W. Chapman, F.S.S., M.I.J., Secretary, Kent and Romney Marsh Sheep Breeders' Association, &c.

The occasion of the second visit of the Bath and West and Southern Counties Society to Rochester and Chatham, has been deemed a fitting opportunity to give some account of that breed of sheep, which holds, in the immediate district of the Show, a pre-eminent position.

The history of the breed would be intensely interesting, but, unfortunately, there is no record, sufficiently full to be of any value, and consequently we have no reliable particulars of the methods adopted by old breeders to increase the value of their sheep, to improve their quality, and to add to their capacity for development. In the days preceding registration, all records were kept in a very perfunctory manner, except by the more careful

breeders, but, so far as the writer's knowledge extends, there are not even such records available at the present time.

Under these circumstances, and as we are more directly interested with existing sheep rather than with those that have been, this article will not include particulars of the breed beyond the year 1890, when the Society last visited Rochester.

All true followers of the flock-masters of former generations must acknowledge that they are greatly benefiting by the work of their predecessors, and no doubt trust and desire that their successors may equally profit by the work of the present generation of breeders.

The condition of the Kent or Romney Marsh breed in the year 1890 can best be described by the one word—"chaos." There were a few leading breeders who regularly exhibited, and at the 1890 Show there were no less than sixty-nine entries, but no records whatever were available for public information regarding the breeding of those sheep. Moreover, there was no cohesion between the breeders; each represented no further interest than his own and had no object beyond satisfying himself. Little, if any, attempt was made to secure a share of the custom arising from the greater area of demand abroad and in the Colonies. I am inclined to believe that the excellent exhibition of the breed at the last Rochester Show of the Bath and West Society acted as a strong inducement to breeders to combine to make the breed better known.

Whether this was so or not it is quite certain that from the year 1890 there was a growing desire on the part of the more progressive breeders to unite in raising the breed from that condition, which fully justified the description so often applied to it, viz., that it was "a local breed," to its present position.

It was during the years 1892, 1893, and 1894 that the writer was continually being reminded by one or two breeders that the Kent Sheep were not advancing in public favour as rapidly as other breeds, and in 1894, at an important dispersal sale held by the late Mr. T. Powell, at which some very high prices were realised, several breeders suggested that the time had come for the formation of a Breed Society. Ultimately, in the year 1895, the writer, in conjunction with Mr. E. Buss, took the preliminary step of calling a meeting at the Saracen's Head Hotel, Ashford, Kent, and at that meeting, which was very largely attended, it was unanimously resolved to form the Kent or Romney Marsh Sheep-Breeders' Association. The Association was founded, and published its first volume, in the same year, with an entry of thirty-eight flocks, and a membership of forty-eight. From then until now, the best

characteristics of the breed have been steadily developed, and the demand for sheep has increased by leaps and bounds. The breed now ranks as one of the principal ones required by breeders of sheep in the Argentine, Patagonia, Punta Arenas, Chili, the Falkland Islands, the Australasian Colonies and New Zealand; in the latter country it holds the leading position.

During the past year a ram realised 250 guineas, while in the previous year a number of rams sold at not less than 150 guineas, and at the annual sale, held at Ashford, one breeder's nineteen rams fetched an average of £36 19s. 5d.

This satisfactory result shows not only what combination, as represented by the present Association, can do, but also how high are the merits of the breed. Its sound constitutional vigour and strength, its ability to withstand hardships and exposure, its freedom from attacks of liver-fluke, and foot-rot (for it is said by some authorities in New Zealand that it is "fluke-proof") are strong points in its favour. Then again, it is quite certain that foreign and colonial buyers, under present day conditions, would not continue their patronage to any breed deficient in quantity and quality of fleece or in depth of flesh and quality of meat.

There can be no doubt that the present improved condition of the Kent or Romney Marsh breed, taken as a whole, dates back to the time when the individual pedigrees of the various sheep used for breeding purposes by the leading breeders became available for reference. No Breed Society has stricter rules than the society representing this breed. It has, from the start, insisted upon every sire used by its members being individually entered in the Flock Book; hence the information contained in its fifteen volumes of records enables the export buyer to select rams that will, by reason of their careful breeding and pedigree, be likely to transmit to their progeny their own characteristics. Some two or three breeders of leading flocks are at the present time able to say that every individual male and female in their flock has its pedigree fully recorded in the Flock Book.

At the Rochester Show in 1890 the late Mr. Richard Garne, who judged the Kent sheep, remarked that the two-shear ram, belonging to Mr. F. Neame, which was awarded first prize in the old Ram class, as well as the special prize, was a good representative of its breed, and indeed it was. This ram, as also its sire (a ram bred by Mr. T. Powell) was entered in the first volume of the Flock Book. To show how valuable the Flock Book is to breeders, the entries respecting this ram enable them to trace its influence, through its descendants, for a period of eighteen or nineteen years. It proved

itself to be a most remarkable animal at stud, for it was used in the Macknade flock in 1889, 1890, 1891 and 1892. Three of its progeny were subsequently used, and from these are descended a remarkable series of rams, which have been sires of prize-winners and leading stud sheep for generation after generation. Practically the whole of the leading families at present in the Macknade flock trace their pedigree through two rams, "Macknade Bead 6th" and "Royal York,"—the latter being first prize-winner at the Royal Show at York in 1883,—and directly back to "Proof," first prize and champion sheep at Rochester in 1890. Another exhibit at the 1890 Show furnishes further proof of the value of a public record. Two rams entered in Vol. 1 as "Eastboro' 4th and 5th" were prize-winners for Mr. F. Baker at that Show, taking second prize for a pair of ram lambs. This strain of blood is represented in many of the leading flocks of the present day, but had not the pedigrees of these sheep been thus recorded our present day breeders would not have known the good stock from which their present sheep are descended.

It is hardly necessary to give facts and figures to refute that oft-repeated statement, that the breed is one which matures very slowly. Nothing can be further from the truth than this, for the Kent or Romney Marsh sheep develop and mature fully as quickly as any other breed under similar conditions.

Unfortunately in this country, which boasts of being the "Stud Farm of the World," there are but few opportunities of securing reliable data with reference to the development and maturing of its various breeds of live stock. The only exhibition of fat stock that has, for a series of years, thoroughly and consistently followed one straight course in this direction is the Smithfield Club, for there every animal entered is weighed on its arrival. Consequently as the age is given in the catalogue one is able, from these two facts, to arrive at a definite conclusion as to the capacity for development of the various animals exhibited. The following tables, which cover a period of twelve years, show in the case of the Kent sheep an average daily gain of live weight, both in respect to lambs under 12 months of age, and to wethers between 12 and 24 months of age, that compares most favourably with that of any other breed.

Every pen present in the respective classes, whether prize-winner or not, is included in these tables, and attention may be called to the fact that during the past twelve years there have been exhibited at Smithfield eighty-seven pens of lambs, which have given an average daily gain of 9.75oz., and that during the same period eighty-five

pens of wethers have given an average daily gain of 6.87oz. These satisfactory averages prove that the breed matures as rapidly as any other.

LAMBS UNDER 12 MONTHS OLD.

Year.	No. Present.	Aggregate Age in Days.	Aggregate Live Weight.	Highest Daily Gain in Class.	Lowest Daily Gain in Class.	Average Daily Gain of Class.
			lb	oz.	oz.	oz.
1898	7	1,764	982	10.10	7.27	8.90
1899	5	1,247	765	10.90	9.26	9.81
1900	6	1,520	938	10.79	9.11	9.86
1901	9	2,280	1,354	10.60	7.56	9.50
1902	8	1,987	1,218	10.75	9.33	9.80
1903	11	2,774	1,706	11.28	8.84	9.84
1904	9	2,284	1,398	10.97	8.24	9.74
1905	6	1,506	949	10.91	9.24	10.05
1906	7	1,755	1,069	10.78	8.53	9.74
1907	7	1,786	1,116	11.30	8.86	9.99
1908	7	1,756	1,061	10.21	9.11	9.66
1909	5	1,331	824	11.93	8.43	9.96
Total	87	21,990	13,380	—	—	9.73

WETHERS OVER 12 MONTHS AND NOT EXCEEDING 24 MONTHS.

Year.	No. Present.	Aggregate Age in Days.	Aggregate Live Weight.	Highest Daily Gain in Class.	Lowest Daily Gain in Class.	Average Daily Gain of Class.
			lb.	oz.	oz.	oz.
1898	11	6,748	2,831	7.38	6.33	6.71
1899	5	3,066	1,367	7.98	6.85	7.13
1900	6	3,689	1,564	7.21	6.45	6.78
1901	8	4,900	2,178	7.75	6.36	7.11
1902	11	6,776	3,002	7.55	6.55	7.08
1903	7	4,298	1,860	7.66	6.51	6.92
1904	9	5,568	2,346	7.24	6.30	6.74
1905	9	5,530	2,404	7.76	6.06	6.95
1906	4	2,497	1,044	6.95	6.35	6.68
1907	7	4,310	1,861	7.29	6.34	6.93
1908	6	3,671	1,548	7.20	6.29	6.74
1909	2	1,195	522	7.15	6.83	6.98
Total	85	52,248	22,527	—	—	6.87

So far as regards the average daily gain, the breed can, under equal conditions, fully hold its own with any other. Its value as a grazing sheep is beyond question, not only in our own large marshland districts, but in others beyond the sea, and to this is no doubt due the largely increased demand during the past ten or fifteen years for the breed for export purposes.

It is a characteristic of the breed that it will graze evenly all over

its field or marsh. It has been found, and the writer is supported in the statement by reports from many estancieros and other large sheep-owners in the Colonies and abroad, that the Kent sheep will not, like some breeds, flock together; this is a valuable characteristic in countries where the flocking together of sheep produces rank herbage, and tends to taint the land. Go where they may, they spread abroad all over the area whereon they are confined, and their notable self-reliance shows itself in a remarkable degree. Alike on our home marshlands in lambing time, or on the vast estancias of the Argentine, Chili, and Patagonia, or the runs in New Zealand and Australia, the ewes are dotted all over the place, each with its own lambs and no others, and if the dam be grazing, its lambs will be resting separately where she left them. Hence, such sheep are less liable to infectious and other diseases than are many of the other breeds.

Another interesting point in connection with the breed, valuable alike for the home flock-master and for the foreign and colonial breeder, came to my notice in course of conversation with a breeder who had recently sold some rams for export. I enquired of the seller if he knew why this particular client should have come for Romney Marsh sheep, as he was closely identified with another breed. The vendor told me that, having asked this question of the buyer, the answer returned was—"Had we been purchasing for wool growing, as we have been for many years past, I should not have come after your sheep, but we are purchasing with a view to increasing our mutton production, hence the reason why your breed has been selected."

There is a popular fallacy that the Down and dark-faced breeds produce the better quality of mutton. This, however, is not borne out by the fact that, in the wholesale market, preference is shown for New Zealand mutton and lamb over that imported from other countries. It will be seen from the agricultural returns of the Dominion that the larger proportion of sheep in that great mutton and wool producing country are of the white-faced breeds which, according to the latest information, number no less than 78.58 per cent. of the whole of the Stud Sheep and Flock Rams in that country, whilst the number of Romneys represents no less than 31.66 per cent. of the aggregate total, or in other words the number of Stud Sheep and Flock Rams of this breed in New Zealand at the present time is but a shade under one-third of the aggregate for the whole Colony.

VI.—ANNUAL REPORT UPON THE SOCIETY'S GENERAL OPERATIONS.

By Thos. F. Plowman, Secretary and Editor.

The accompanying Report, having been received and adopted at a meeting of the Council held on May 27th, 1909, was submitted to the Annual General Meeting of Members held on the following day in the Showyard at Exeter, and, on the motion of The President (Lord Clinton), seconded by Mr. C. R. Collins, was approved and ordered to be printed in the Society's Annual Journal :—

" The Council, in presenting their report, feel assured that the members generally share with them the gratification they feel in once more re-visiting Exeter, where the Society is always sure of a hearty welcome and where some of the most successful of its meetings have been held. As on previous occasions, the Council have to express their indebtedness to the Local Committee for their efforts to promote the success of the Show and for the cordiality with which they have worked to this end.

" The Council have also particular pleasure in acknowledging the very friendly co-operation of the Devon County Agricultural Association, who have suspended their show for the year and have contributed £100 to the prize list. Your Council have been glad to reciprocate this by adding several classes for breeds specially associated with the district and by conferring the same privileges, as to admissions and entries, upon the members of the Devon Association as are enjoyed by the members of the Bath and West Society.

" The exhibition is a very large one, and a comparison of the number of entries with that when the Society last visited Exeter is an indication of the growth of the Society in the interval. In 1899 the entries of Live Stock and Produce numbered 1,802 ; in 1909 they are 2,130, whilst there has been a considerable increase in the space required for Implements and Machinery. These figures are the more remarkable from the fact that in the Live Stock classes the Society has in recent years limited the number of entries an exhibitor can make in one class, and has also adopted a more restrictive policy than formerly with respect to the nature of the exhibits in the Implement section of the Show.

" In response to the request of the British Goat Society, an unusual addition has been made to the live stock in the Exeter Yard by an exhibition of Goats.

" The interest taken in the Nature Study Exhibitions previously held by the Society, and the general consensus of opinion as to their usefulness, induced the Council to continue the series at

Exeter. The exhibition is confined to educational bodies in Devon and the adjoining counties, and this has resulted in the gathering together of a very interesting and instructive collection.

"In view of the importance of Forestry to the country at large, and of the national benefits likely to acrue from systematic investigation of matters pertaining to it, the Council, three years ago, determined to invite the co-operation of corporate bodies and private landowners in carrying out an exhibition illustrative of the subject. The success which attended this and succeeding exhibitions afforded every encouragement to continue them, and the Council have been enabled to add this very interesting feature to the other attractions of the present show.

"To the Art-Manufactures Section, an exhibition of Lace has, for the first time for many years, been added; the competition in the classes for this work being confined to pupils atttending the Devon County Council Classes.

"The Society's sphere of work, apart from the Show, has been similarly enlarged, especially in the direction of practical and scientific research.

"Experiments with reference to the improvement of grass land, and others for the purpose of demonstrating the effects of lime upon certain soils, are in progress, and the Council are also conducting, in conjunction with the Board of Agriculture, an experiment for ascertaining the influence of various manures upon the production of mutton.

"The Council have made a furthur grant of £100 towards the National Fruit and Cider Institute, the establishment of which was due to the practical and scientific research work initiated by the Society, with the help of Mr. R. Neville Grenville, and conducted for some years under its auspices and those of the Board of Agriculture, at Butleigh. Experimental and research work is being actively carried on at the Institute, which there is every reason to believe is of essential service to those engaged in cider-making and fruit-growing. An arrangement has been made under which members of the Society can obtain from the Institute, free of charge, analyses of cider apples and perry pears.

"The Institute has also undertaken to distribute to the Society, or to persons nominated by it, free of charge, a selection of trees which have been worked with the best varieties of cider apples and perry pears, and has conferred upon the Society the privilege of nominating, free of all fees, one student for a course of instruction in the theory and practice of fruit-growing, cider-making, &c., to be held by the Institute at University College, Bristol.

"With a view of assisting farmers and others to deal with insect and other pests which affect agriculture, horticulture, &c., the Council have accepted an offer from the Board of Economic Biology, University College, Bristol, to investigate the nature of any insect or other pest and report upon it free of charge.

"A suggestion having been made that the Society should, in addition to the usual annual summer show, hold an annual show of Dairy Stock and Produce in the Autumn, the Council appointed a Special Committee to consider and report how far this might be desirable and practicable, having regard to the charge it would be upon the Society's funds and the support it would be likely to receive.

"After instituting enquiries in different directions and ascertaining the feeling of various Agricultural Societies and persons within the district embraced by the Society's operations, the Committee reported that the evidence in favour of the scheme was not sufficiently strong to justify proceeding with it at present, and the Council endorsed this.

"The Council having been asked to lend its influence with a view of inducing the Board of Agriculture to remove the present restrictions upon the importation of Canadian Store Cattle, resolved to adhere to the attitude they have always taken up and to strongly oppose any relaxation of the restrictions in question.

"The Council have by means of a resolution—copies of which have been forwarded to the leaders of the Government and the Opposition in both Houses of Parliament, to the Presidents of the Local Government Board and the Board of Agriculture and Fisheries, and to the English Committee for the Budapest Dairy Congress—expressed their opinion that, in case of fresh regulations being issued as to the inspection of Dairies in England, no milk should be received from other countries, except from Dairies subject to inspection similar to that enforced in the British Isles.

"The Council having been informed of a proposal to establish a University at Bristol, unanimously passed the following resolution:—

> "That the Council regard with entire satisfaction the steps that are being taken to secure a Charter for the establishment of an independent University in the West of England. They believe that such a University would be of inestimable service in stimulating educational progress, and they are of opinion that a well staffed and well equipped Department of Economic Biology, with facilities for special research in connection with agricultural problems, would be welcomed by all interested in agriculture in the West."

"The Council regret that during the past year death has deprived the Society of three of its vice-presidents, viz.: Mr. H. P. Jones, who for many years, as Chairman of Finance and in other capacities, rendered invaluable service; Mr. R. R. M. Daw, who, until incapacitated by illness, was for long an active Steward of Arts as well as a staunch friend of the Society, ever ready to promote its best interests; and Col. W. E. Brymer, one of the Society's oldest supporters.

"The Council have re-appointed Mr. H. B. Napier and Sir C. T. D. Acland, whose terms of office had expired, as Representative Governors of the National Fruit and Cider Institute.

"The Council having been requested by the Governing Body of the Royal Agricultural College, Cirencester, to nominate a Representative Governor of the College, have complied with this by nominating Prof. J. Penberthy, who has been duly appointed.

"The Council have nominated Mr. G. E. Lloyd-Baker as the Society's delegate at the International Congress of Agricultural Associations and Rural Demography to be held at Brussels in 1910.

"The Council having been invited by the County Council's Association to appoint a representative to attend the Rural Education Conference in London in March last, requested Sir C. T. D. Acland to represent the Society.

"The Council have much pleasure in recommending that the Earl of Darnley be elected President for the ensuing year; that Lord Clinton be elected a Vice-President in recognition of the admirable way in which he has discharged the duties of the Presidency during the past year; and that the Duke of Devonshire, Mr. J. Herbert Benyon and the Hon. W. F. D. Smith, M.P., be also elected Vice-Presidents, in recognition of their generous support of the Society.

"The Southern Division of the Society's area not having been visited for some years, the Council have gladly accepted an invitation, very cordially tendered by the Corporations of Rochester and Chatham, to hold the 1910 Meeting within their joint borders.

"The Council have also accepted an equally cordial invitation from the Lord Mayor and Corporation of Cardiff to hold the 1911 Meeting in that city, and they feel sure that the Members generally will appreciate this evidence of the kindly regard in which the Society is held by the Principality."

VII.—REPORT OF AN EXPERIMENT FOR ASCERTAINING THE INFLUENCE OF VARIOUS MANURES UPON THE PRODUCTION OF MUTTON.

By W. Ashcroft, Steward.

This experiment has now been conducted for ten years; nine (1901-1909) since the first application of the various manures; 1900, the first year, was devoted to testing the plots before the manures were applied.

Particulars and details of the results obtained in previous years have appeared in the corresponding numbers of the Society's Journal, and the present report will furnish particulars of the conduct and results of the grazing in 1909, and some few remarks on the experiments as a whole.

Sheep Selected.

The sheep selected were 118 cross-bred tegs (Southdown and Kent), of which more than half might be described as fairly forward in condition, and the other as very useful stores. Unfasted they averaged in the wool 91 lbs., very much the same weight as the sheep last year.

Stocking the Plots.

The number of sheep put on the plots was as follows:—

11 on Plots 1, 3, 4, 5, 7, 8, 9, 10, 11
12 on Plot 2
7 on Plot 6.

The above, with the exception of Plot 2, is a slight reduction on the last six years. Not anticipating such a very good growing season as was experienced, and remembering that one or two seasons we had been rather heavily stocked, and also that it was one more year since the manures had been applied, the number of sheep was reduced from 12 to 11 on Plots 1, 3, 4, 5, 7, 8, 9, 10, 11, from 9 to 7 on Plot 6, and Plot 2, which grew so much clover in 1908, was left with 12—this being the same number to which it was raised in the second month last year; as the season turned out, the plots could well have carried the number put on in previous years, for they were always more than full of grass.

Total Increase of Live Weight on each Plot, 1900—1909.

No. of Plot.	Total Increase in Live Weight in 1900. Plots Untreated.	Treatment of Plots.	Total Incrse. 1901.	Total Incrse. 1902.	Total Incrse. 1903.	Total Incrse. 1904.	Total Incrse. 1905.	Total Incrse. 1906.	Total Incrse. 1907.	Total Incrse. 1908.	Total Incrse. 1909.	Average 9 years.
	lbs.		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	214	8 cwt. Cotton-cake or $2\frac{2}{3}$ cwt. per acre fed in 1901 and 1902; none in 1903, 1904, 1905 and 1906. 14 cwt. or $4\frac{2}{3}$ cwt. per acre 1907 and 15 cwt. or 5 cwt. per acre 1908; none in 1909 ..	435	523	444	377	405	261	622	665	453	465
2	221	4 tons of Lime per acre. 5 cwt. Basic Slag per acre June, 1907	324	412	347	331	347	192	414	594	545	389
3	206	10 cwt. Basic Slag per acre (= 200 lbs. Ph. Acid)	361	570	500	366	492	396	579	490	474	470
4	220	5 cwt. Basic Slag per acre (= 100 lbs. Ph. Acid), and the same repeated for 1904	318	517	451	402	486	385	572	469	480	453
5	196	7 cwt. Superphos. (= 100 lbs. Ph. Acid) per acre. and the same repeated for 1904	328	522	496	407	480	406	526	451	456	452
6	244	Untreated	301	378	352	269	309	268	395	314	275	318
7	221	7 cwt. Superphos. and $1\frac{1}{2}$ cwt. Sulph. Potash (= 50 lbs. Potash) per acre; Potash repeated for 1903 and 1907, and the Super. repeated for 1904	266	506	504	409	541	468	548	432	550	469
8	221	7 cwt. Super. and $\frac{1}{2}$ ton ground Lime; ground Lime repeated for 1903 and 1907, and the Super. repeated for 1904	285	475	512	451	513	473	538	433	484	463
9	202	7 cwt. Super. and 97 lbs. Sulph. Ammonia (= 20 lbs. N.) per acre, Sulph. of Ammonia repeated for 1903, 1904 and 1907, and the Super. repeated for 1904	258	438	490	363	385	396	485	397	478	410
10	234	6 cwt. dis. bones (= 100 lbs. Ph. Acid and 17 lbs. N.) per acre, and the same repeated for 1904 ..	279	456	477	381	420	467	483	428	497	432
11	235	Untreated in 1900, 1901, 1902; for 1903 5 cwt. Basic Slag per acre, and 4 cwt. Cotton-cake fed = $1\frac{1}{3}$ cwt. per acre during 1903, 1904, 1905, 1906, and 5 cwt. = $1\frac{2}{3}$ cwt. per acre 1907, 1908; $1\frac{1}{2}$ cwt. per acre 1909	293	355	541	477	450	427	534	495	522	7 years. 492
Total	2,414	.. ..	3,448	5,152	5,114	4,233	4,828	4,139	5,696	5,168	5,214	

INCREASE OR DECREASE IN LIVE WEIGHT, 1901—1909, AS COMPARED WITH UNTREATED PLOT.

No. of Plot.	TREATMENT OF PLOTS.	Total Increase or Decrease in Live Weight of Mutton of Manured Plots over 2 Untreated Plots in 1901 and 1902, and over 1 Untreated Plot in 1903-1908.									Total Increase 9 years.	Average per year.
		1901	1902	1903	1904	1905	1906	1907	1908	1909.		
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	8 cwt. Cotton-cake or $2\frac{2}{3}$ cwt. per acre fed in 1901 and 1902; none in 1903, 1904, 1905 and 1906. 14 cwt. or $4\frac{2}{3}$ cwt. per acre 1907 and 15 cwt. or 5 cwt. per acre 1908, none in 1909 ..	138+	157+	92+	108+	100+	7–	227+	351+	178+	1344(*a*)	149
2	4 tons of Lime per acre. 5 cwt. Basic Slag per acre June, 1907	27+	46+	5–	62+	38+	76–	19+	280+	270+	661(*c*)	73
3	10 cwt. Basic Slag per acre (= 200 lbs. Ph. Acid)	64+	204+	148+	97+	183+	128+	184+	176+	199+	1383	154
4	5 cwt. Basic Slag per acre (= 100 lbs. Ph. Acid), and the same repeated for 1904	21+	151+	99+	133+	177+	117+	177+	155+	205+	1235	137
5	7 cwt. Superphos. (= 100 lbs. Ph. Acid) per acre, and the same repeated for 1904	31+	156+	144+	138+	171+	138+	131+	137+	181+	1227	136
6	Untreated	..	..	..	..	..	..	..	..	..	..	..
7	7 cwt. Superphos. and $1\frac{1}{2}$ cwt. Sulph. Potash (= 50 lbs. Potash) per acre; Potash repeated for 1903 and 1907, and the Super. repeated for 1904	31–	140+	152+	140+	232+	200+	153+	118+	275+	1379	153
8	7 cwt. Super. and $\frac{1}{2}$ ton ground Lime; ground Lime repeated for 1903 and 1907, and the Super. repeated for 1904	12–	109+	160+	182+	204+	205+	143+	119+	209+	1319	147
9	7 cwt. Super. and 97 lbs. Sulph. Ammonia (= 20 lbs. N.) per acre, Sulph. of Ammonia repeated for 1903, 1904 and 1907, and the Super. repeated for 1904	39–	72+	138+	94+	76+	128+	90+	83+	203+	845	94
10	6 cwt. dis. bones (= 100 lbs. Ph. Acid and 17 lbs. N.) per acre, and the same repeated for 1904 ..	18–	90+	125+	112+	111+	199+	88+	114+	222+	1043	116
11	Untreated in 1900, 1901, 1902; for 1903 5 cwt. Basic Slag per acre, and 4 cwt. Cotton-cake fed = $1\frac{1}{3}$ cwt. per acre during 1903, 1904, 1905, 1906, and 5 cwt. = $1\frac{2}{3}$ cwt. per acre 1907, 1908, $1\frac{1}{2}$ cwt. per acre 1909	..	..	189+	208+	141+	159+	139+	181+	247+	1264(*b*)	181
	Total	181+	1125+	1242+	1274+	1433+	1191+	1351+	1714+	2189+	11700	

(*a*) Cake fed 4 years out of 9. (*b*) 7 years only, first two was an untreated plot.
(*c*) This increase made almost entirely in the last two years since the plot had 5 cwt. Basic Slag given it in the summer of 1907.

Date of Stocking.

The plots were stocked April 16th; in the previous four years the dates have been April 8th, 17th, 3rd, and 4th.

Character of the Season.

Seasons, as was remarked in last year's report, introduce a most variable factor in the conduct of these experiments. Just as the season experienced in 1908 was exactly the reverse of 1907, so 1909 was the reverse of 1908. In 1908 we longed for rain and a little more growth in the herbage; in 1909 we had always too much rain and too much growth, and longed for a little more sun and drier weather.

The wet season caused us for the first time in the conduct of the experiment to be troubled with cases of lameness on some of the plots, curiously enough on Plots 1 to 5, not on Plots 6 to 11. Some allowance had to be made therefore in the actual weights on Plots 1 to 5; 3 sheep on Plot 1, 3 on Plot 2, 1 on Plot 3, 1 on Plot 4, 3 on Plot 5, being allowed the average gain of the other sheep on their respective plots for the time they were affected.

Excluding Plots 1, 2 and 11, as the treatment has not been uniform, it will be seen that the total weight produced in 1909 on Plots 3 and 5 are very close to an average of the 9 years (1901-1909), that Plots 4, 8, 9, 10 and 7 are above the average of the same years, more particularly Plot 7, and that Plot 6 (untreated) is below the average.

The table showing the increase as compared with the untreated plot is the most interesting feature of the year's work, and one of the most striking of the experiments as a whole. Excluding Plots 1 and 2, which varying in their treatment, can hardly be brought into the comparison, it will be seen that the increase over the untreated plot is far higher than the average of other years, and is higher (with one slight exception of Plot 3 in 1902) than any return on any plot in any other year.

It might be said that by reducing the number of sheep from 9 to 7 on the untreated, and from 12 to only 11 on the others, this result might partly be accounted for; but it must be pointed out that an inspection of the plots from month to month during the season showed Plot 6 to be the only one that did not seem to be understocked.

The difference was naturally more decidedly marked in the first two months; during the first two months, *i.e.*, from the middle of April to the middle of June, the increase of the seven sheep on Plot 6, was 15.8 lbs. per sheep, whereas the average on the other

plots where there were 11 sheep (and in the case of Plot 2, 12) was 23.7 lbs.; so that the manured plots carrying *fully half as many sheep again as Plot* 6 *increased per sheep half as much again.* Nothing surely could more clearly show the value of manurial dressings to obtain grass at a time of year when it is of the most value, and also the length of time in which residuary effects can be seen; for 1909 is the sixth season since the phosphates were re-applied on Plots 4, 5, 7, 8, 9, and 10, and the third since the potash and lime were re-applied on Plots 7 and 8, and the ninth since Plot 3 received anything at all.

Casualties.

We did not lose a sheep during the season, one sheep only was detrimentally affected by fly, and the one misfortune that attended the year's working was the lameness that affected some of the sheep on Plots 1 to 5, to which allusion has already been made.

Purchase and Sale.

Sheep were supposed to be much cheaper this Spring than in 1908, but the trade at Lamberhurst Fair, in Kent, where the sheep were bought, was brisk enough, and certainly not more than 3s. a head cheaper than the previous year, if that; whereas the price out was decidedly lower; the ninety-five sheep sold by weight realised 5s. 6d. a stone, which may be considered a fortunate price.

The following table gives particulars of Purchase and Sale :—

Purchase.	£	s.	d.	Sale.	£	s.	d.
118 Sheep (including Commission)	241	4	6	95 Sheep @ 5s. 6d. per stone	202	15	0
Freight and Droving ..	7	10	5	23 Sheep @ 37s.	42	11	0
Balance to profit	29	17	7	Wool @ 9½d., less 11s. 2d. Commission	33	6	6
	£278	12	6		£278	12	6

The balances for other years are shown in the following table :—

1900	..	£20	3	9
1901	..	13	5	11
1902	..	52	13	6
1903	..	46	14	5
1904	..	44	18	0
1905	..	63	1	3
1906	..	29	7	9
1907	..	48	11	3
1908	..	11	16	6
1909	..	29	17	7
		£360	9	10 an average of £36 0s. 11d.

The ninety-five sheep sold per live weight, were drawn August 5, 22, September 2, 33, September 30, 40; they killed very well, and averaged about 51 per cent. of their fasted live weight, and the butcher was pleased with them all. By running the experiment into another month most of the remaining twenty-three could have been sold in the same way.

Average Monthly Gain of all Sheep on Plots.

Year.	1st Month.	2nd Month.	3rd Month.	4th Month.	5th Month.	6th Month.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1900	9.5	6.7	9.2	5.5	..	..
1901	12.0	10.2	3.2	6.0	5.3	..
1902	17.5	11.5	9.9	7.7	.2	..
1903	14.5	9.7	6.3	2.5	4.0	4.6
1904	13.7	10.4	6.8	3.7	1.4—	..
1905	10.9	10.1	8.2	5.8	2.4	2.9
1906	10.9	5.8	9.9	5.6	1.9*a*	..
1907	14.1	11.7	10.3	4.6	3.7	2.3
1908	6.6	11.2	14.6	2.1	4.5	3.7
1909	13.9	9.1	7.9	6.2	5.8	3.3

a from July 24 to August 18.

The above extended table shows that the sheep made a fairly steady increase during most of the time, but follows the universal rule that the greater part of the weight is put on in the first two or three months. It is not necessary to burden the report with the tables supplied to the Board of Agriculture which give the monthly weights of every sheep, but the average gain per head per month on each plot can be seen in the following table:—

Average Gain per Head per Month in 1909.

Plot No.	1st Month.	2nd Month.	3rd Month.	4th Month.	5th Month.	6th Month.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	14.0	9.9	8.7	1.7	5.3	.1
2	12.3	10.3	9.7	6.0	7.1	2.0
3	13.7	11.0	6.5	5.3	6.0	2.0
4	14.8	8.5	7.5	7.0	4.3	2.6
5	14.1	8.8	5.6	5.0	6.7	2.8
6	7.7	8.4	8.9	7.6	5.6	6.3
7	16.3	8.7	8.6	8.6	5.4	6.0
8	14.5	9.4	8.3	5.3	3.9	6.0
9	13.7	8.3	8.8	6.9	4.7	3.7
10	17.1	8.5	6.6	7.1	6.0	1.8
11	15.1	8.1	7.5	6.3	9.1	3.8

WEIGHT OF GRASS CUT ON SUB-PLOTS $\frac{1}{20}$TH AN ACRE.

No. of Plot.	1909.	1908.	1907.	1906.	1905.	1904.	1903.	1902.	1901.	1900.	Total 9 years 1901-09.	Average
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	404	311	313	111	261	410	295	432	82	201	2,619	291
2	603	511	201	94	267	324	198	370	41	163	2,609	290
3	593	353	745	201	541	622	440	825	84	182	4,404	489
4	577	379	1,011	200	724	715	333	722	112	140	4,773	530
5	543	319	891	220	524	591	341	763	42	123	4,234	470
6	319	230	565	177	313	578	264	412	96	101	2,954	328
7	567	314	1,100	404	646	804	320	750	72	80	4,977	553
8	469	260	972	318	566	695	305	740	117	165	4,442	494
9	572	255	1,108	316	507	795	391	862	151	225	4,957	551
10	556	259	1,011	211	437	800	385	836	181	218	4,676	520
11	485	269	883	302	661	420	394	574	97	207	4,085	454
	5,688	3,460	8,800	2,554	5,447	6,754	3,666	7,286	1,075	1,805		

The above table gives a very good criterion of the hay crop brought about by the character of the season in the early summer. Divide them all by a 1,000, and the proportional weight of the hay crop would be about as follows :—

1909.	1908.	1907.	1906.	1905.	1904.	1903.	1902.	1901.	1900.
5.7	3.3	8.8	2.5	5.4	6.7	3.6	7.3	1.0	1.8

The following table compares the weight of grass cut with the untreated plot :—

Plot.	Average Increase or Decrease over Plot 6 for 9 years.	Percentage. Increase or Decrease.
	lbs.	%
1	37—	11.3 decrease
2*	38—	11.6 decrease
3	161	49.0 increase
4	202	61.6 increase
5	142	43.3 increase
7	225	68.6 increase
8	166	50.6 increase
9	223	68.0 increase
10	192	58.5 increase
11	126	38.4 increase

* The growth on Plot 2 is interesting. During the seven years following the application of the lime, the weight of grass was 38 per cent. *less* than on the untreated plot (6). For the two years, 1908 and 1909, following the application of 5 cwt. of Basic Slag in the summer of 1907, the weight of grass was 102 per cent. *more* than Plot 6.

Excluding Plots 1, 2 and 11, and comparing Plots 3, 4, 5, 7, 8, 9 and 10 with Plot 6, it will be seen that during the nine years the average increase on the weight of grass is greatest in Plots 7 and 9, where sulphate of potash and sulphate of ammonia have been respectively added to superphosphate, the increase in both cases being practically the same—68 per cent. and 68.6 per cent; the next best results are shown on Plot 4 (basic slag two applications) and Plot 10 (dissolved bones) which show increases of 61.6 and 58.5 per cent. Then come superphosphate with ground lime Plot 8, basic slag, one application, Plot 3, and superphosphate alone Plot 5, with increases of 50.6, 49.0 and 43.3 per cent.

This is not quite the same order of merit as the sheep place the grass in, and the following table puts them side by side.

Plot.	Percentage Increase in weight of Grass over Plot 6 for 9 years.	Percentage Increase in weight of Mutton over Plot 6 for 9 years.
	%	%
3	49.0	48
4	61.6	43
5	43.3	42
7	68.6	48
8	50.6	46
9	68.0	29
10	58.5	36

Plot 9 (Sulphate of Ammonia added to Superphosphate) from practically the top immediately comes to the bottom, and 3, 4, 5, 7 and 8 are not separated by any great difference.

Taking the plots individually :—

Plot 1 (cake fed in 1901 and 1902, none in 1903-06, cake again fed in 1907 and 1908, none in 1909). This being the first season since cake was consumed in 1907 and 1908, the plot showed a fair growth of grass, but not equal to the manured Plots, and the unequal way in which sheep leave their dressing when they lie up under the fencing and on the higher ground during the night was more strongly marked than ever.

This will explain partly why the amount of grass cut on the sub-plot is lighter than the other plots, except Plot 6. The sub-plots have been on the opposite side to Plot 2 and there were no sheep adjacent to that side (the outermost side of the plots)—the sheep on Plot 1 therefore always lay next to Plot 2—the consequence being that that side received most of their droppings to the detriment of the other.

Plot 2 (4 tons of lime per acre for 1901, and 5 cwt. Basic Slag June, 1907). For the second time since the application of Basic Slag

in 1907 Plot 2 again cut the greatest weight of grass, entirely owing to the thickness of clover herbage, which, though not quite so marked a feature as in 1908, placed the plot to the eye decidedly above everything else. It is to be regretted that lameness should have affected some of the sheep; the pecuniary loss caused by the expense of the application of lime is again considerably diminished, but requires another year for its complete disappearance.

Plot 3 (10cwt. Basic Slag for 1901).

Plot 4 (5 cwt. Basic Slag for 1901 and 5 cwt. for 1904).

Plot 5 (7 cwt. Superphosphate for 1901 and 7 cwt. for 1904).

The above three plots were all very much alike to look at, though preference would be given to Plot 3; they were all very full of grass during the whole of the season, with a fair sprinkling of clover.

Plot 6 (untreated). In contrast with the manured plots Plot 6 showed the effect of poverty in the first two months more strikingly than in any previous season, and the effect on the sheep has already been remarked upon. The rainy character of the season and the light stocking caused an improvement in its appearance, but the contrast between Plot 6 and the other plots was all through the season more evident than anything else.

Plot 7 (same manuring as Plot 5 with $1\frac{1}{2}$ cwt. of Sulphate of Potash added for 1901, 1903 and 1909) next to Plot 2, was certainly the best plot in appearance this season, and decidedly above the others; the sheep again confirm what is evident to the eye, for the weight of mutton produced is the most, though not much above Plot 2.

Plot 8 (same manuring as Plot 5, with 5 cwt. Ground Lime added for 1901, 1903 and 1907).

Plot 9 (same manuring as Plot 5, with 97 lbs. Sulphate of Ammonia added for 1901, 1903, 1904 and 1907.

Plot 10 (dissolved bones, 6 cwt. for 1901, and the same repeated for 1904).

Plot 11 (untreated in 1900-02, 5 cwt. Basic Slag for 1903, and the sheep receiving cake at the rate of $\frac{1}{2}$ lb. per day for the latter part of the grazing season). The above four plots showed but little difference in appearance; Plot 9, it may be noted, has done comparatively very much better, and one might almost say the further you get from the time of the Sulphate of Ammonia dressing the better; for 1909 gave a better grazing result than 1907 or 1908, the Sulphate having been applied for 1907, and again 1906 gave a better grazing result than 1904 and 1905, the Sulphate having been applied for 1904.

The cake allowed on Plot 11 enabled all sheep on that plot to be finished and sold to the butcher.

Financial Comparison.

No. of Plot.	Treatment.	Total Increase in Weight of Mutton *per acre* in 9 years over Untreated Plot.	Money Value at 4d. per lb. Live Weight.	Cost of Manures per acre.	Profit per acre per annum. 9 years.	Loss per acre per annum. 9 years.
		lbs.	£ *s.* *d*	£ *s.* *d.*	*s.* *d.*	*s.* *d.*
1	8 cwt. Cotton-cake, or $2\frac{2}{3}$ cwt. per acre, fed in 1901 and 1902; none in 1903, 1904, 1905, and 1906. 14 cwt. or $4\frac{2}{3}$ cwt. per acre 1907. 15 cwt. or 5 cwt. per acre in 1908. Nothing in 1909	445	7 8 4	5 17 4	3 5	
2	4 tons of Lime per acre. 5 cwt. Basic Slag per acre June, 1907	220	3 13 4	5 12 6	..	4 4
3	10 cwt. Basic Slag (= 200 lbs. Ph. Acid) per acre	461	7 13 8	1 5 0	14 3	
4	5 cwt. Basic Slag (= 100 lbs. Ph. Acid) per acre, and the same repeated for 1904 ..	412	6 17 4	1 5 0	12 6	
5	7 cwt. Superphos. (= 100 lbs. Ph. Acid) per acre, and the same repeated for 1904 ..	409	6 16 4	1 16 4	11 1	
6	Untreated	..	..	..	..	
7	7 cwt. Superphos. and $1\frac{1}{2}$ cwt. Sulph. Potash (= 50 lbs. Potash) per acre: Potash repeated for 1903 and 1907, and the Super. repeated for 1904	460	7 13 4	4 1 4	8 0	
8	7 cwt. Superphos. and $\frac{1}{2}$ ton ground Lime; ground Lime repeated for 1903 and 1907, and the Super. repeated for 1904	439	7 6 4	3 16 10	7 10	
9	7 cwt. Superphos. and 97 lbs. Sulph. Ammonia (= 20 lbs. N.) per acre; Sulph. of Ammonia repeated for 1903, 1904 and 1907, and the Super. repeated for 1904	282	4 14 0	4 4 8	1 0	
10	6 cwt. dis. bones (= 100 lbs. Ph. Acid and 17 lbs. N.) per acre, and the same repeated for 1904	347	5 15 8	3 1 2	6 1	
11	Untreated in 1900, 1901, 1902, 5 cwt. Basic Slag per acre for 1903, and 4 cwt. Cotton-cake = $1\frac{1}{3}$ cwt. per acre during 1903, 1904, 1905, 1906, and 5 cwt. = $1\frac{2}{3}$ cwt. per acre during 1907 and 1908. $1\frac{1}{2}$ cwt. per acre for 1909 ..	421*a*	7 0 4	4 10 9	7 1	

a For 7 years only.

General Deductions at Sevington.

(1). That for grazing purposes all manuring has paid with the exceptions of liming and the addition of Sulphate of Ammonia to Superphosphate, but that the pecuniary result is largely dependent on the original cost of the manure; the percentage of increase on the manured plots over the untreated plot may be put as follows:—

Plot	1	..	45	per cent.
,,	3	..	48	,, ,,
,,	4	..	43	,, ,,
,,	5	..	42	,, ,,
,,	7	..	48	,, ,,
,,	8	..	46	,, ,,
,,	9	..	29	,, ,,
,,	10	..	36	,, ,,
,,	11	..	57	,, ,, (seven years only).

1, 3, 4, 5, 7 and 8 would, from the above, be fairly close, but the various costs of the dressings, or the cake on Plot 1 materially alter the profit per acre; the same remark applies to Plot 11.

(2). The manures are by no means exhausted; compare increases over Plot 6 made this year.

(3). Basic Slag is the most economical way of applying Phosphates, and Dissolved Bones the least so; the latter, irrespective of cost, has not on the whole during the course of the experiment given as good results as either Basic Slag or Superphosphate.

(4). For grazing purposes the addition of Sulphate of Ammonia to Superphosphate is decidedly detrimental, and the addition of Potash or Ground Lime does not produce a result commensurate with the cost.

Remembering the projudicial effect of lime on the growth of grass on Plot 2 for seven years, the extraordinary alteration produced by the application of 5 cwt. Basic Slag in 1907 is one result of the experiment which may be classed as unique.

(6). The results at Sevington very largely agree with the results obtained at Cockle Park; in the one we have partly drift clay and partly chalky loam lying on chalk, in the other a poor boulder clay resting on clay; and it was pointed out very fully in Vol. XIV. that the natural sheep grazing powers of the Cockle Park land was less than one-half that at Sevington. Bearing in mind these two facts it is interesting to find that in almost all the main points of the experiment they corroborate one another.

Note to Deduction 2.—Though the experiment has now been brought to a conclusion, it has been arranged with Mr. Stratton

that the fencing of the plots should stand for another two years, that next year they should be cut for hay and not grazed, and that in the following year, 1911, they should again be tested by grazing; this it is to be hoped, if the seasons are favourable, will throw further light on the residuary effect of the manures.*

VIII.—THE SOCIETY'S EXPERIMENTS FOR THE IMPROVEMENT OF PERMANENT PASTURE.

These experiments have been carried out at Stockbridge, near Sherborne, Dorset, on land owned by F. J. B. Wingfield Digby, Esq., and occupied by Mr. Bird, and at Hatherton Farm, Sampford Courtenay, North Devon, on land owned by the Provost and Scholars of King's College, Cambridge, and occupied by Mr. James Searle.

The Steward (Mr. E. A. Rawlence) reports with reference to these plots that "Basic Slag still works wonders, and the tenants are so satisfied with the results that they are using it on their own account to a considerable extent."

(*Particulars of the earlier treatment of the Plots will be found in previous volumes of the Society's Journal.*)

* The Board of Agriculture and Fisheries have expressed their appreciation of the skill with which Mr. Ashcroft has carried out this important experiment, and their thanks for the careful reports he has submitted to them from time to time.—ED. B. & W. JOURNAL.

IX.—THE SOCIETY'S EXHIBITION AT EXETER.

By Thos. F. Plowman, Secretary and Editor.

The Society's 1909 Exhibition at Exeter was opened on Wednesday, May 26, and closed on Monday, May 31.

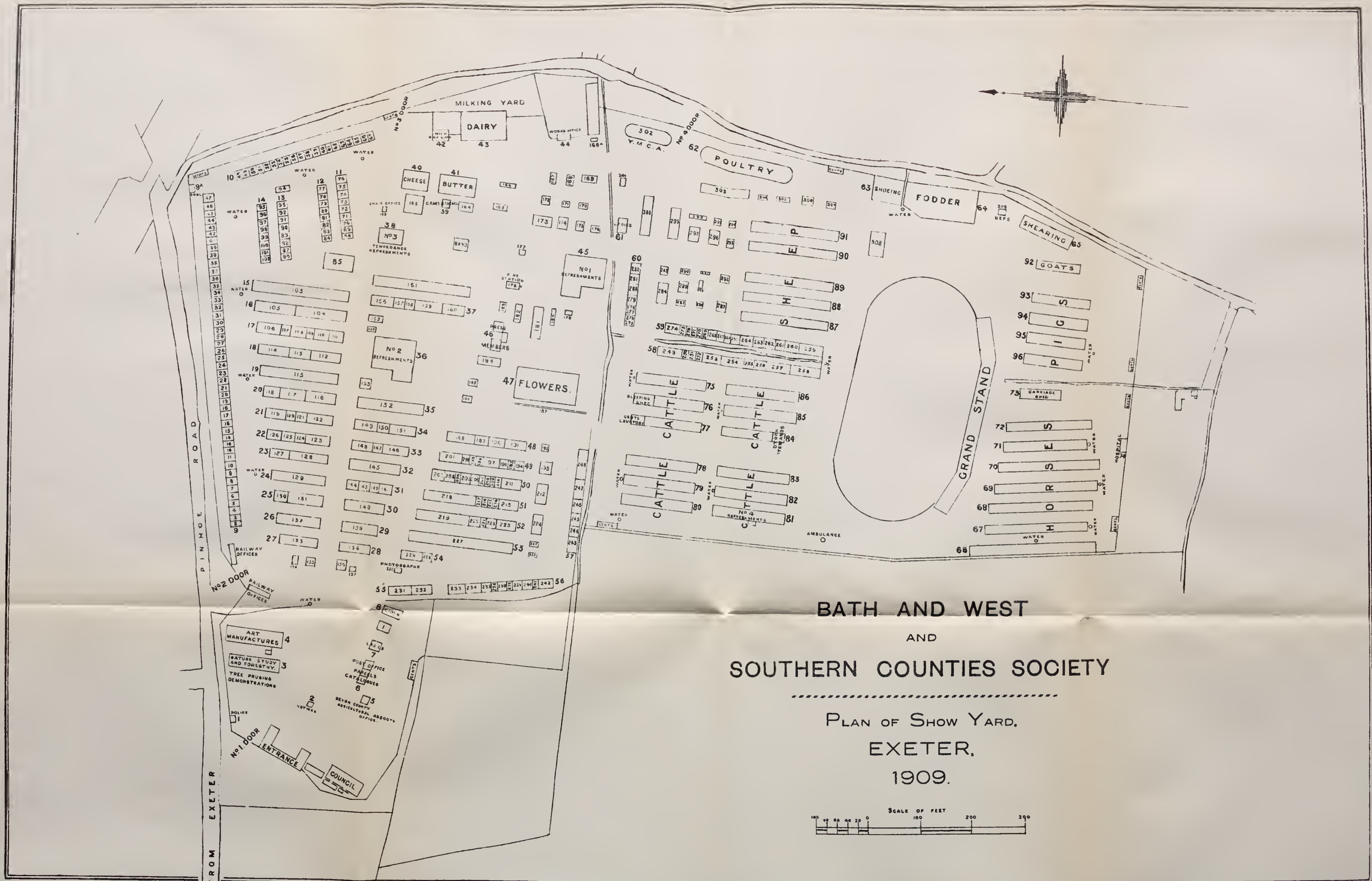
A plan showing the situation and arrangement of the Yard faces this page.

Entries.

The following is a comparative statement of the entries in the Stock and Produce Classes in 1879, 1889, 1899, and 1909.

	Exeter, 1879.	Exeter, 1889.	Exeter, 1899.	Exeter, 1909.
Horses :—				
Agricultural	28	31	58	34
Hunters, Hacks, Ponies, Harness and Jumping	95	118	175	210
	— 123	— 149	— 233	— 244
Cattle :—				
Devon	38	64	52	47
South Devon	0	0	23	52
Shorthorn	43	38	72	63
Hereford	33	56	31	45
Sussex	48	48	11	9
Jersey	50	152	113	121
Guernsey	38	68	86	49
Aberdeen-Angus	0	0	0	11
Kerry and Dexter ..	0	0	30	47
Dairy	0	18	35	64
	— 250	— 444	— 453	— 508
Sheep	207	182	192	227
Goats	0	0	0	58
Pigs	81	78	119	126
Poultry	287	463	528	696
Farm Produce :—				
Cheese	0	46	69	61
Cream Cheese, Butter and Cream	0	95	138	147
Cider	0	0	70	63
	— 0	— 141	— 277	— 271
	948	1,457	1,802	2,130

A list of the Awards, names of the Judges, etc., will be found on pages *i* to *lxxxix* of the Appendix to this Volume.



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CIDER.

A separate report dealing with the Cider section of the Exhibition will be found on pages 101 to 105.

PRIZES.

The money prizes in 1909 were contributed as follows :—

	£	s.	d.
Bath and West and Southern Counties Society ..	2,842	5	0
Devon County Agricultural Association	100	0	0
Shire Horse Society	5	0	0
Hackney Horse Society (or Medal)	5	0	0
Lord Tredegar	12	0	0
Devon Cattle Breeders' Society	17	0	0
Shorthorn Society	20	0	0
The Dairy Shorthorn (Coates's Herd Book) Association	10	0	0
Hereford Herd Book Society	20	0	0
English Aberdeen Angus Cattle Association ..	10	0	0
English Jersey Cattle Society	120	0	0
Royal Jersey Agricultural Society	10	10	0
English Kerry and Dexter Cattle Society	20	0	0
Southdown Sheep Society	17	0	0
Hampshire Down Sheep Breeders' Association ..	10	0	0
Oxford Down Sheep Breeders' Association ..	10	0	0
Dorset Down Sheep Breeders' Association ..	40	0	0
Exmoor Horn Sheep Breeders' Society	10	0	0
British Goat Society	18	0	0
British Berkshire Society	5	0	0
Large Black Pig Society	12	0	0
Somerset Agricultural Instruction Committee ..	10	0	0
Devon County Education Committee	48	15	0
	£3,372	10	0

Gold, Silver and Bronze Medals were also given by the Society, and Medals or Plate by the Shire Horse Society, the Hunters' Improvement Society, the Hackney Horse Society, the Polo and Riding Pony Society, Sir Harry Trelawney Eve, the Sussex Herd Book Society, the Aberdeen Angus Cattle Society, the English Aberdeen Angus Cattle Association, B. de Bertodano, Esq., the English Kerry and Dexter Cattle Society, the English Jersey Cattle Society, the English Guernsey Cattle Society, the Southdown Sheep Society, the British Goat Society, the National Pig Breeders' Association, the Devon County Education Committee, and the Poultry Club.

IMPLEMENTS.

The following is a comparative statement of the number of feet run of shedding provided for Implements, Machinery, etc., and of

the number of square feet of open space occupied by exhibits unsuitable for shedding :—

		Exeter, 1879.	Exeter 1889.	Exeter, 1899.	Exeter, 1909.
Machinery in Motion ..	..feet run	826	616	1,050	1.386
Agricultural and General Implements and Vehicles	,,	4,369	4,200	4,601	3,735
Seeds, Cattle Foods, Artificial Manures, &c.	,,	521	550	895	1232
		5,716	5,366	6,546	6,353
Open space for Farm and Horticultural Buildings, &c.	sq. feet	4,156	11,792	17,989	36,363
		9,872	17,158	24,535	42,716

MISCELLANEOUS DEPARTMENTS.

Nature Study and Forestry Exhibitions (particulars of which are given on pages 106 to 109) were again noteworthy features of the Show, and excited much interest.

A fully equipped Working Dairy, in which the Butter-Making Competitions were held, formed as usual a prominent feature of the Show. Here various dairy implements and appliances—including power and hand separators—were shown at work, and the best methods of making butter and clotted cream were practically demonstrated.

There were also Shoeing, Shearing, Butter-Making, and Milking Competitions, the following being a comparative statement of the entries :—

	Exeter, 1879.	Exeter, 1889.	Exeter, 1899.	Exeter, 1909.
Butter-Making	0	92	99	118
Ditto (Local)	0	0	143	29
Shoeing	50	50	79	73
Ditto (Local)	0	0	43	33
Shearing (Local)	0	0	76	44
Milking	0	0	12	30
	50	142	452	327

The Show was inaugurated on the opening day by the Mayor of Exeter, who attended in state, accompanied by the members of the Corporation, and by the Local Committee. They were received by the President of the Society (Lord Clinton) and the members of the Council of the Society.

Daily musical performances were given by the band of the Royal Marine Light Infantry (Plymouth Division).

The usual Sunday service, at which there was a large attendance of herdsmen and others engaged in the yard, was held in the Working Dairy. It was conducted by the Society's Chaplain (the Rev. A. T. Boscawen), who was assisted by the Vicar of Heavitree (the Rev. T. J. Ponting), in whose parish the Showyard was situated. The sermon was preached by the Bishop of Exeter (Dr. Robertson). The Heavitree Parish Church Choir kindly attended the service, and led the singing, the accompaniments being played on an American organ by the organist, Dr. Ferris Tozer.

Reference must be made to the kindly thought of the Exeter Branch of the Young Men's Christian Association, who had space in the Show Yard placed at their disposal by the Stewards for the erection of a reading and writing tent for the special use of those engaged in looking after the stock, etc., in the yard. Here the Association, besides providing stationery, etc., gave little entertainments and addresses in the evening. The provision made for them was thoroughly appreciated by those for whom it was intended.

Attendance.

The first of the following tabular statements refers to the number of persons who paid for admission to the Show Yard, and the second to the admission receipts :—

Number of Admissions.	Newport, 1907.	Dorchester, 1908.	Exeter. 1909.
At 7*s*. 6*d*. (Season Tickets)	259	235	122
,, 2*s*. 6*d*.	15,088	9,774	13,128
,, 1*s*.	35,363	20,576	38.569
,, 6*d*.	3,345	1,992	4.970
Total	54.055	32,577	56,789

Receipts.	Newport, 1907.			Dorchester, 1908.			Exeter, 1909.		
	£	s.	d.	£	s.	d.	£	s.	d.
Show Yard	3,834	14	3	2,388	13	3	3,739	9	0
Horse Ring Stand	346	13	6	346	18	0	421	4	0
Working Dairy	15	6	0	2	18	6	3	10	9
	4,196	13	9	2,738	9	9	4,164	3	9

The Show may be regarded as very successful from every point of view, including the financial, and in this latter respect compares favourably, in its result, with previous meetings of the Society at Exeter, as shown by the following statement:—

Year.	Admissions.	Admission Receipts.	Profit.	Loss.
1879	55,167	3,899 16 9	—	798 0 5
1889	52,600	3,891 10 7	460 11 7	—
1899	55,923	4,029 5 9	101 9 4	—
1909	56,789	4,164 3 9	1018 6 11	—

A comparative statement of attendances since 1852 will be found on pages *ci*, *cii* of the Appendix to this volume.

X.—THE MILK TEST CLASSES AT THE EXETER EXHIBITION.

By Dr. J. A. Voelcker, M.A., F.I.C., etc., Consulting Chemist to the Society.

Owing to the holding of the seventh International Congress of Applied Chemistry, in London this year, simultaneously with the Exeter meeting of the Society, I was prevented from attending personally at Exeter. My usual duties at the Show were, however, ably carried out by Mr. Ernest Mathews, to whom my warm thanks are due. Mr. Mathews took the various samples and despatched them to me; my present duty is, therefore, only to report on the analytical results obtained.

The Classes were the usual ones—Class 109 for cows of any breed, under 900lbs. live weight, and Class 110 for those of 900lbs. live weight or over. In addition there was another class (108) for Devon cows entered in, or eligible for, Davy's "Devon Herd Book."

For the last-named class six animals competed, while for Classes 109 and 110 there were twenty-one competitors, seven of these—all being Jerseys—coming into the light-weight class, and fourteen—made up of one Shorthorn, three Lincoln Reds, seven Devons, one Guernsey, and two cross-breds—composing the heavy-weight class.

The cows were all stripped dry on the evening of Thursday, May 27, and the morning and evening's milk of the following day was sampled for the purpose of the test.

In the Devon class all the six cows gave milk well above the required "limits" of quality, the lowest fat percentage being 3.50 in the morning, and 3.80 in the evening.

Mr. Chick's "Charmer" was first with 46.8 points, Mr. Kidner's "Dorothy Lass" following with 43.42 points, and Mr. Chick's "Compton Lady 2nd" being placed third. The points gained in this class, however, as will be observed, fell much below those obtained in Class 110, wherein Mr. Vosper's two South Devon cows gained the 2nd and 3rd prizes with 59.95 and 59.47 points respectively. Mr. Morgan's "Colley 19th," as at Dorchester in the year previous, gained the Reserve number, with almost identical points on each occasion.

In the light-weight class (109) there was but one disqualification for deficiency of quality of milk, and even here the margin was very small. Mr. Smith-Barry's "Caprice" was an easy winner, with 57.75 points against the 43.6 points of the same owner's "Flanders Girl" and the 42.7 points of Lady Smyth's "Walcombe Sharstone."

In the heavy-weight class (110) disqualifications for deficiency of quality in the milk were frequent, no less than eight cows out of the fourteen competing being ruled out on this account. One of the cows (No. 595) was known not to be well, and this is reflected in the yield and quality of the milk. The other disqualifications included one Shorthorn, two Lincoln Reds, two South Devons, one Guernsey, and one cross-bred. In all these cases both the fat and total solids were deficient.

Mr. Evens' Lincoln Red Shorthorn "Burton Fuchsia 3rd" was an easy winner in this class, with 71.62 points, the total milk yield for the day being the high figure of 71lb. 2oz., and this forty-five days since calving. The quality of the milk, both morning and evening, came well above requirements, the lowest fat percentage being 3.60. The other two Lincoln Reds in this class, however, gave milk below the required quality. The Shorthorn cow, No. 243, gave the second highest yield of milk, though 13lb. 10oz. below that of the first prize winner, and deficient in quality. The second and third prizes went to Mr. Vosper's two South Devon cows, Nos. 596 and 597, with almost identical points, another South Devon cow (No. 588) being Reserve.

It is worthy of note that the First Prize-winners in Classes 109 and 110 occupied similar positions in the Butter Test competitions.

The full particulars, analyses, etc., are given in the tables on pages 96, 97. The points awarded were:—One for each pound of milk, and one for every ten days since calving, deducting the first forty days.

MILK TEST CLASSES.

No. in Catalogue.	Owner and Cow.	Breed.	Age.	No. of Days in Milk.	Quantity of Milk. Morning.		Evening.		Total.	
			Years		lbs.	oz.	lbs.	oz.	lbs.	oz.
	CLASS 108. DEVON COWS.									
143	Mr. T. S. Morgan's "Colley 19th" ..	Devon	8½	62	19	2	13	12	32	14
576	Mr. J. H. Chick's "Charmer"	,,	—	128	22	0	16	0	38	0
577	Mr. J. H. Chick's "Flora 4th"	,,	5¼	57	15	0	11	8	26	8
578	Mr. W. D. Chick's "Compton Dewdrop"	,,		74	17	12	12	12	30	8
579	Mr. W. D. Chick's "Compton Lady 2nd"	,,	4¼	64	20	0	15	6	35	6
580	Mr. N. J. Kidner's "Dorothy Lass" ..	,,	7	63	23	8	17	10	41	2
	CLASS 109. Cows under 900 lbs. live weight.									
379	Mrs. McIntosh's "Frolicsome 5th" ..	Jersey	5½	42	24	8	17	12	42	4
385	Lord Rothschild's "Triangle 2nd" ..	,,	3½	45	22	2	16	6	38	8
387	Mr. J. H. Smith-Barry's "Caprice" ..	,,	4	163	25	4	20	8	45	12
401	Mr. J. H. Smith-Barry's "Flander's Girl"	,,	3⅓	71	23	2	17	6	40	8
581	Lady Smyth's "Walcombe Sharstone" ..	,,	8	147	18	8	13	8	32	0
584	Mr. A. Pocock's "Landlady"	,,	6¼	116	16	8	13	0	29	8
586	Mr. A. F. Somerville's "Julia"	,,	9	184	15	14	11	0	26	14
	CLASS 110. Cows 900 lbs. live weight and over.									
194	Messrs. W. & H. Whitley's "Peeper" ..	S. Devon	11	116	25	10	25	10	51	4
243	Lord Rothschild's "Carril 33rd" ..	Shorthorn	9	36	32	4	25	4	57	8
577	Mr. J. H. Chick's "Flora 4th"	Devon	5¼	57	15	0	11	8	26	8
579	Mr. W. D. Chick's "Compton Lady 2nd"	,,	4¼	64	20	0	15	6	35	6
582	Mrs. Bainbridge's "Braw Lass"	Guernsey	8	61	18	10	16	14	35	8
588	Mr. T. Cundy's "Iris 2nd"	S. Devon	8¾	27	31	6	24	10	56	0
589	Mr. T. Cundy's "Buttercup"	,,	—	87	24	14	17	12	42	10
590	Mr. J. Evens' "Burton Fuchsia 3rd" ..	Lincoln Red	7	45	42	2	29	0	71	2
591	Mr. J. Evens' "Burton Milker 3rd" ..	,,	6	71	32	0	24	2	56	2
593	Mr. G. Ll. Palmer's "Bracebridge" ..	,,	4	44	28	4	27	8	55	12
594	Mr. G. W. Stark's "Nancy"	Cross-bred	7	146	22	8	17	8	40	0
595	Mr. G. W. Stark's "Daisy"	,,	6¼	134	14	6	10	12	25	2
596	Mr. W. P. Vosper's "Cowslip 5th" ..	S. Devon	8¼	87	30	0	25	4	55	4
597	Mr. W. P. Vosper's "Victoria"	,,	6½	86	30	12	24	2	54	14

Milk Test Classes.

Quality of Milk.				No. of Points for Milk.	No. of Points for Lactation.	Total No. of Points.	Awards.
Morning.		Evening.					
Fat.	Solids.	Fat.	Solids.				
per cent	per cent	per cent	per cent				
3.75	12.87	4.15	13.32	32.87	2.20	35.07	Reserve.
3.90	13.40	4.00	13.76	38.0	8.80	46.80	First Prize.
3.55	13.07	4.05	13.51	26.50	1.70	28.20	
4.30	13.67	4.60	14.18	30.50	3.40	33.90	
3.50	12.87	3.80	13.18	35.37	2.40	37.77	Third Prize.
3.65	12.76	4.20	13.35	41.12	2.30	43.42	Second Prize.
3.10	11.78	5.10	13.91	42.25	.20	42.45	Deficient in Total Solids.
5.10	14.70	5.80	15.45	38.50	.50	39.00	Reserve.
3.50	12.89	4.90	14.29	45.75	12.00	57.75	First Prize.
3.65	12.82	4.80	14.12	40.50	3.10	43.60	Second Prize.
5.40	14.97	5.80	15.31	32.00	10.70	42.70	Third Prize.
4.80	14.28	5.50	14.87	29.50	7.60	37.10	
4.00	13.09	5.40	14.63	26.87	12.00	38.87	
2.43	11.40	4.90	13.74	51.25	7.60	58.85	Deficient in quality.
2.82	11.68	3.80	12.62	57.50	nil	57.50	Deficient in quality.
3.55	13.07	4.05	13.51	26.50	1.70	28.20	
3.50	12.87	3.80	13.18	35.37	2.40	37.77	
2.50	11.73	4.10	13.22	35.50	2.10	37.60	Deficient in quality.
3.40	12.52	4.50	13.20	56.00	nil	56.00	Reserve.
2.87	11.63	3.40	11.92	42.62	4.70	47.32	Deficient in quality.
3.60	12.58	3.95	13.19	71.12	.50	71.62	First Prize.
1.78	10.10	2.80	11.32	56.12	3.10	59.22	Deficient in quality.
2.30	11.04	3.60	12.48	55.75	.40	56.15	Deficient in quality.
2.98	11.83	3.20	11.98	40.00	10.60	50.60	Deficient in quality.
2.28	10.36	2.00	9.90	25.12	9.40	34.52	Cow unwell.
3.10	12.24	4.40	13.43	55.25	4.70	59.95	Second Prize.
3.05	12.39	3.80	12.92	54.87	4.60	59.47	Third Prize.

XI.—THE BUTTER TEST CLASSES AT THE EXETER EXHIBITION.

By Ernest Mathews.

Twenty-seven cows, out of an entry of thirty-three, arrived at the Show yard, Exeter, to compete in a three-days' butter test for the special prizes, the money for which had been collected by Mr. A. Miller-Hallett from members of the English Jersey Cattle Society. The amounts offered in each class were as follows:—1st prize, £20; 2nd prize, £12; 3rd prize, £8; 4th prize, £5; 5th prize, £3; 6th prize, £2; and in addition to these the English Jersey Cattle Society offered their Gold, Silver, and Bronze medals.

The points under which the prizes were awarded were calculated on the same basis as in the one day's tests; full points for the period of lactation being given each day and added together. The points therefore were as follows:—One point for every ounce of butter, one point for each completed 10 days in milk, deducting the first 40 days. Maximum allowance for period of lactation, 36 points. Certificates of merit were granted for Jersey cows and Highly Commended cards for cows of other breeds, under five years old, obtaining 90 points, and for cows five years old and over obtaining 105 points.

The classes were open to any breed or cross, the following 19 animals competing in the Heavy Weight class—900lbs. live weight or over:—8 Jerseys, 5 South Devons, 3 Lincoln Reds, 1 Guernsey, 1 Cross-bred, and 1 Devon.

In the Light Weight class—cows under 900lbs. live weight—only Jerseys were present, the number being eight.

The cattle were stripped out on Thursday at 5 p.m., the milk of the next three days being taken for the test. The milks were separated each morning and evening.

Churning was commenced on Monday morning at eight o'clock, but owing to some of the yields being so large, the lots were in most cases churned in two portions, the result being that the awards were not published until just before the close of the show.

The following are the awards:—

Cows of any Breed or Cross, under 900 lbs. Live Weight.

	Days in Milk.	Milk. lbs.	Milk. ozs.	Butter. lbs.	Butter. ozs.	Ratio.	Points.	Awards.
Mr. Smith Barry's *Caprice*, Jersey	163	140	2	6	7	21.76	139.00	First
Lady Smyth's *Walcombe Starstone*, Jersey	147	89	0	5	5¼	16.70	117.65	Second
Mr. Pocock's *Landlady*, Jersey	116	87	14	5	2¾	16.99	105.85	Third
Mr. Smith Barry's *Flandres Girl*, Jersey	71	116	10	5	9¼	20.90	98.85	Fourth
Lord Rothschild's *Triangle 2nd*, Jersey	45	116	8	5	12¼	20.20	94.05	Fifth

CLASS 111.—COWS OF ANY BREED OR CROSS UNDER 900 LBS. LIVE WEIGHT.

No. in Catalogue.	Exhibitor.	Name of Cow.	Breed.	Date of Birth.	Date of Last Calf	No. of Days in Milk.	Total Milk Yield for 3 Days. lb.	oz.	Butter Yield 3 Days. lb.	oz.	* Butter Ratio.	No of Points for Butter.	Total Points for Lactation	Total No. of Points.	Awards.
387	J. H. Smith-Barry	Caprice, xx-273 ..	Jersey	July 28, 1905	1908 Dec. 16	163	140	2	6	7	21.76	103.00	36.00	139.00	1st Prize and G.M.
581	Lady Smyth ..	Walcombe Starstone, xv-408	Jersey	June 30, 1901	1909. Jan. 1	147	89	0	5	5¼	16.70	85.25	32.40	117.65	2nd Prize and B.M.
584	A. Pocock.. ..	Landlady, xv-325 ..	Jersey	Feb. 1, 1903	Feb. 1	116	87	14	5	2¾	16.99	82.75	23.10	105.85	3rd Prize
401	J. H. Smith-Barry	Flandres Girl, xx-307	Jersey	Jan. 7, 1906	March 18	71	116	10	5	9¼	20.90	89.25	9.60	98.85	4th Prize
385	Lord Rothschild	Triangle 2nd, imp. ..	Jersey	Dec. 13, 1905	April 13	45	116	8	5	12¼	20.20	92.25	1.80	94.05	5th Prize
376	J. M. F. Fuller ..	Brown Fancy, xix-262	Jersey	Feb. 10, 1904	April 24	34	94	6	5	4½	17.86	84.50	nil	84.50	—
379	Mrs. McIntosh ..	Frolicsome 5th, xvi-290	Jersey	Jan. 1, 1904	April 16	42	125	12	4	2½	30.25	66.50	.90	67.40	—
586	A. F. Somerville ..	Julia, xix-330 ..	Jersey	June 3, 1900	1908 Nov. 25	184	81	0	4	4½	18.91	68.50	36.00	104.50	—

Class 112.—Cows of any Breed or Cross 900 lbs. Live Weight or over.

No. in Catalogue.	Exhibitor.	Name of Cow.	Breed.	Date of Birth.	Date of Last Calf.	No. of Days in Milk.	Total Milk Yield for 3 Days.	Butter Yield 3 Days.	* Butter Ratio.	No. of Points for Butter.	Total Points for Lactation.	Total No. of Points.	Awards.
					1909		lb. oz.	lb. oz.					
590	J. Evens	Burton Fuchsia 3rd	Lincoln Red	1902	April 13	45	212 10	8 5¼	25.53	133.25	1.80	135.05	1st Prize.
375	Lady de Rothschild	Lady Phyllis, xvi-325	Jersey	Mar. 12, 1902	March 30	59	143 4	7 11	18.63	123.00	6.00	129.00	2nd Prize and S.M.
596	W. P. Vosper ..	Cowslip 5th	S. Devon	Feb. 28, 1901	March 2	87	167 4	6 10¾	25.06	106.75	14.40	121.15	3rd Prize.
606	Col. Coote	Wench, xiv-373 ..	Jersey	May 6, 1899	Jan. 12	136	82 0	5 5½	15.34	85.50	29.10	114.60	4th Prize.
597	W. P. Vosper ..	Victoria	S. Devon	Oct. 8, 1902	March 3	86	167 14	6 4	26.86	100.00	14.10	114.10	5th Prize.
582	Mrs. Bainbridge ..	Braw Lass	Guernsey	June 22, 1901	Mar. 28, 1909	61	110 10	4 11¾	23.36	75.75	6.60	82.35	—
194	W. & H. Whitley..	Peeper	S. Devon	May 26, 1898	Feb. 1, 1909	116	149 0	5 8½	27.01	88.25	23.10	111.35	6th Prize.
591	J. Evens	Burton Milker 2nd ..	Lincoln Red	1903	Mar. 18, 1909	71	165 8	6 0¾	27.36	96.75	9.60	106.35	H.C.
593	G. L. Palmer ..	Bracebridge	Lincoln Red	Mar. 18, 1905	April 14, 1909	44	164 12	5 9	29.61	89.00	1.50	90.50	H.C.
599	Dr. H. Watney ..	Wild Tansy, xviii-441	Jersey	Feb. 6, 1904	Dec. 26, 1908	153	78 4	4 9¼	17.09	73.25	34.20	107.45	C.M.
600	Dr. H. Watney ..	Maple's Lavanja, xix-353	Jersey	Aug. 28, 1904	Feb. 17, 1909	100	75 10	5 2¾	14.62	82.75	18.30	101.05	C.M.
601	Dr. H. Watney ..	Red Maple, x-320 ..	Jersey	July 14, 1896	Oct 26, 1908	214	91 8	4 7¼	20.54	71.25	36.00	107.25	C.M.
377	Lt.-Col. Garratt ..	Briar Rose	Jersey	April 13, 1903	Mar. 25, 1909	64	123 6	5 14½	20.88	94.50	7.50	102.00	—
588	T. Cundy	Iris 2nd	S. Devon	July 17, 1900	May 1, 1908	27	166 4	5 13¼	28.52	93.25	nil	93.25	—
589	T. Cundy	Buttercup	S. Devon	—	March 2, 1909	87	128 4	5 9¾	22.86	89.75	14.40	104.15	—
595	G. W. Stark ..	Daisy	Cross-bred	Feb. 22, 1903	Jan. 14, 1909	134	83 4	2 0½	41.62	32.50	28.50	61.00	—
602	Dr. H. Watney ..	Sabean 2nd, ix-290..	Jersey	Dec. 21, 1895	Dec. 5, 1908	174	68 12	4 4½	16.05	68.50	36.00	104.50	—
604	J. H. Chick ..	Wynford Cherry ..	Devon	Jan., 1902	Jan. 29, 1909	119	106 6	4 4½	24.84	68.50	24.00	92.50	—
605	J. M. F. Fuller ..	Golden Unit, xv-292	Jersey	Feb. 17, 1902	Dec. 12, 1908	167	79 14	4 4	18.79	68.00	36.00	104.00	—

* The "Butter Ratio" represents the number of lbs. of milk required to make 1 lb. of butter. Ten lbs. of milk are reckoned as equal to an Imperial gallon.

Cows of any Breed or Cross, 900 lbs. Live Weight or over.

Mr. Evens' *Burton Fuchsia 3rd*, Lincoln Red	45	212 10	8 5¼	25.53	135.05	First
Lady de Rothschild's *Lady Phyllis*, Jersey	59	143 4	7 11	18.63	129.00	Second
Mr. Vosper's *Cowslip 5th*, South Devon	87	167 4	6 10¾	25.06	121.15	Third
Col. Eyre-Cotes' *Wench*, Jersey	136	82 0	5 5½	15.34	114.60	Fourth
Mr. Vosper's *Victoria*, South Devon	86	167 14	6 4	26.86	114.10	Fifth
Messrs. W. & H. Whitley's *Peeper*, South Devon	116	149 0	5 8½	27.01	111.35	Sixth

Mr. Smith-Barry's *Caprice* with 139 points was awarded the gold medal, Lady de Rothschild's *Lady Phyllis* with 129 points the silver medal, and Lady Smyth's *Walcombe Starstone* with 117.65 points the bronze medal.

The average of the cows reduced to one day are as follows :—

No.	Breed.	Days. in Milk.	Yields. Milk. lb. ozs.	Yields. Butter. lb. ozs.	Butter. Ratio. lbs.	Points.
16	Jerseys averaged	116	33 3¼	1 11¾	19.14	35.03
1	Guernsey	61	36 14	1 9¼	23.36	27.45
3	Lincoln Reds averaged	53	60 5	2 3½	27.18	36.87
1	Devon	119	35 7¼	1 6¾	24.84	30.83
5	South Devons averaged	80	51 14	1 15¾	26.14	36.26

It will be seen that the averages are up to the usual standard, showing that a one day's test may be accepted as thoroughly reliable.

The cross-bred cow, No. 595, was not well, which accounts for her poor yield.

As the Butter Tests lasted three days, the work was necessarily heavier than usual. The arrangements made by the Bath and West and Southern Counties Society were excellent, and my special thanks are due to Mr. Somerville, the Steward of the tests, Miss Kirke, Mrs. Luke, and the staff.

XII.—THE SOCIETY'S 1909 EXHIBITION OF CIDER.

By E. W. Farwell, Steward.

The entries of Cider at the Exeter Exhibition in 1909 numbered 63, as against 43 at Dorchester in 1908, 65 at Newport in 1907, and 63 at Swindon in 1906, the classification being the same in each case with the exception that at Newport there were three additional classes for cider made in Monmouthshire, which accounted for 16 out of the 65 entries. This year's show, therefore, may be said to compare very favourably with all the previous exhibitions at which the same conditions have been in force.

The entries in the several classes were as follows :—

Cider made in 1908.	*Entries.*
Class 176—Cask of Cider	21
,, 177—12 Bottles of Cider	33
Cider made in any year previous to 1908.	
Class 178—12 Bottles of Cider	7
Cider made by Tenant Farmers.	
Class 179—Cask of Cider	1
,, 180—12 Bottles of Cider	1
	63

The foregoing list shows in the open classes 21 entries of new cider in cask as against 11 in the previous year at Dorchester; 33 of new cider in bottle as against 19; 7 entries of old cider as against 11; and one entry in both cask and bottle cider in the classes open to *bona-fide* tenant farmers who had never taken a first prize at any exhibition, as against two entries in cask only. Four entries were absent.

In accordance with the usual conditions, all entries had to be delivered into the Yard ten days before the opening of the Show; the cases were then unpacked and both bottles and casks placed in position.

On the 17th May, a sample from each exhibit was taken and forwarded in a special bottle sent for the purpose to Mr. F. J. Lloyd, F.C.S., for analysis. Particulars of these analyses were received from Mr. Lloyd on Monday, 24th May, and are set out in Appendix "A." Out of 59 samples sent for analysis, two were disqualified for containing preservatives.

Mr. J. H. Hill, of New Take, Staverton, Totnes, was the Judge appointed by the Society, and he fulfilled his duties on the first day of the Show.

In the class for Cider in Cask made in 1908, Mr. Tilley obtained first and second prizes with two heavy sweet ciders, and Messrs. Crofts and Son were awarded third prize for a clean, brisk cider. The reserve went to Messrs. Ridler & Son for a choice "ladies'" cider, and Mr. C. Dart's exhibit was very highly commended. Half a dozen entries were soon knocked out of the competition, but to finally place the remainder gave the Judge some trouble, the first three being of very even merit.

In the class for Bottled Cider made in 1908, the first and second prizes were awarded to the Quantock Vale Co. for two brisk ciders

with plenty of body, and the third prize went to Messrs. Ridler & Son for a remarkably good rich cider. Mr. Tilley received the "reserve" and very highly commended cards for samples of rich fruity cider. This class was very well filled, and taken as a whole, contained a lot of good cider.

For bottled cider made previous to 1908 Messrs. Ridler & Son were awarded the first prize for a fairly dry, well-matured cider, with a fine flavour, the second prize going to Mr. T. Stone for a drier Devonshire cider, and the third prize being taken by Messrs. Crofts and Son for a good but sweet sample, while the entry of Messrs. Thomson & Co. was the reserve.

The two classes for *bona-fide* tenant farmers who have never taken a first prize at any public exhibition were very disappointing, there being only one entry in each class. Of these the cask cider was disqualified for containing preservatives, and the entry sent by Mr. E. Wellington in the bottled class was only awarded a second prize, being of but moderate quality and cloudy in appearance.

After the Show at Nottingham in 1905, the classification of cider by counties and according to the percentage of alcohol was abolished for reasons that were fully explained in the report on that year's show, and, therefore, need not be recapitulated here, and the present system was adopted as an experiment. While this has proved fairly satisfactory on the whole, it does not go far enough and exhibitors have evinced some dissatisfaction at the present classification, contending that to put all classes of cider together, irrespective of their sweet or dry quality, is an unfair competition, and that such a classification leads exhibitors to produce only sweet cider, knowing that the majority of judges will award a prize to such a cider in preference to a dry one. The awards at recent exhibitions have proved this contention to be practically correct, and, since it cannot be to the advantage of the industry generally to encourage one class of cider at the expense of another class, the time has evidently come when it is desirable to make a further change, or rather an addition, to the existing classes, if the Bath and West Society is to retain its reputation of going with the times; consequently the following recommendation was made by the Prize Sheet Committee to the Council of the Society and adopted by the latter :—

> That Gold, Silver, and Bronze medals be offered for a Cask (not less than 18 and not more than 30 gallons) of cider made in 1909, and of a specific gravity not exceeding 1.015 at 60° Fahr.
>
> 12 Bottles, ditto, ditto.

A Cask (not less than 18 and not more than 30 gallons) of Cider made in 1909.

12 Bottles, ditto, ditto.

12 Ditto, made in any year previous to 1909.

It was only after considerable discussion with both exhibitors and analysts that a standard of 1.015 specific gravity was fixed, so as to ensure that the entries in this class shall be dry ciders. The second class has been left open as in former years, in order that no more disqualifying tests may be applied than are absolutely necessary, for it is possible that the specific gravity of an entry may slightly decrease between the time of its despatch from the exhibitor and its analysis. This might result in its being disqualified through no real fault on the part of the exhibitor, whilst there is but little chance of a cider of low specific gravity being noticed in company with sweeter ciders in the same class.

It may be here explained, in conclusion, that the two classes for *bona-fide* tenant-farmers who had never taken a first prize at any public exhibition have been so poorly supported since their institution in 1908, that the Council could not continue them, and they will therefore be omitted from the prize-schedule for the Rochester and Chatham Meeting.

ANALYSES OF CIDER, 1909.

Class	No.	Name of Exhibitor.	Specific Gravity.	Alcohol by Volume.	Acidity.	Solids per cent.	Award.
176	1	W. H. Batting ..	absent				
	2	D. J. Crofts & Son	1.022	5.25	.48	7.15	C.
	3	D. J. Crofts & Son	1.032	3.95	.53	9.46	3rd Prize.
	4	C. Dart	1.028	3.50	.39	8.14	
	5	C. Dart	1.026	3.70	.44	7.75	V.H.C.
	6	H. J. Davis ..	1.023	4.25	·39	6.81	
	7	H. J. Davis ..	1.025	3.85	.44	7.22	C.
	8	F. H. Evans & Son	1.026	2.05	.66	9.27	H.C.
	9	C. Kerton	arrived	late			
	10	A. Knight	1.034	2.70	.81	9.18	
	11	Ridler & Son ..	1.032	2.85	.51	8.57	R.
	12	R. Rout & Son ..	1.018	4.30	.50	5.63	
	13	T. Stone	1.023	3.95	.61	6.70	
	14	T. Stone	1.026	3.60	.62	7.50	
	15	T. Stone	1.026	4.25	.58	7.52	
	16	W. T. S. Tilley ..	1.038	3.80	.46	10.94	1st Prize.
	17	W. T. S. Tilley ..	1.037	3.75	.43	10.56	2nd Prize.
	18	W. Turner	1.028	3.85	.40	8.29	
	19	W. Turner	1.022	4.25	.42	6.91	
	20	W. Turner	1.022	4.25	.45	6.54	
	21	H. Wardlaw ..	1.026	3.55	.45	7.20	

Class	No.	Name of Exhibitor.	Specific Gravity.	Alcohol by Volume.	Acidity.	Solids per cent.	Award.
177	22	Sir J. H. H. Amory, Bart.	1.024	3.80	.51	7.00	
	23	W. H. Batting ..	absent				
	24	D. J. Crofts & Son	1.023	5.15	.42	7.37	
	25	D. J. Crofts & Son	1.033	3.80	.45	9.53	
	26	C. Dart	1.027	3.55	.38	7.95	C.
	27	C. Dart	1.028	3.20	.83	8.09	
	28	H. J. Davis ..	1.027	3.85	.47	7.71	
	29	H. J. Davis ..	1.035	2.60	.55	9.49	
	30	F. H. Evans & Son	1.033	2.40	.69	8.62	
	31	C. Ham	1.029	3.10	.40	7.80	
	32	C. Kerton	arrived	late			
	33	A. Knight	1.039	2.50	.92	10.35	
	34	H. Mason	1.036	2.15	.56	9.58	
	35	D. Phelps & Son ..	1.033	2.30	.55	8.74	
	36	D. Phelps & Son ..	1.039	1.75	.51	10.35	
	37	Quantock Vale Co.	1.028	4.55	.48	8.35	2nd Prize.
	38	Quantock Vale Co.	1.028	4.65	.44	8.74	1st Prize.
	39	Ridler & Son ..	1.029	4.30	.56	8.64	3rd Prize.
	40	Ridler & Son ..	1.028	3.55	.68	7.89	C.
	41	R. Rout & Son ..	1.018	5.50	.53	6.04	
	42	R. Rout & Son ..	1.015	5.40	.48	5.49	
	43	J. Slatter & Co. ..	1.045	1.75	.65	11.65	
	44	T. Stone	1.022	4.65	.58	6.92	
	45	T. Stone	1.023	4.30	.42	7.03	
	46	T. Stone	1.024	3.80	.48	7.14	
	47	H. Thomson & Co.	1.031	2.60	.57	8.50	
	48	W. T. S. Tilley ..	1.041	3.30	.39	11.32	H.C.
	49	W. T. S. Tilley ..	1.038	4.40	.44	10.82	V.H.C.
	50	W. T. S. Tilley ..	1.040	3.50	.45	11.48	R.
	51	W. Turner	1.028	3.55	.38	8.33	
	52	W. Turner	1.027	3.80	.41	1.06	
	53	W. Turner	1.022	4.65	.48	6.70	
	54	E. Wellington ..	1.022	3.95	.50	6.51	
178	55	D. J. Crofts & Son	1.032	3.40	.40	9.17	3rd Prize.
	56	Ridler & Son ..	1.029	3.70	.42	8.39	1st Prize.
	57	J. Slatter & Co. ..	1.045	1.75	.67	11.72	
	58	T. Stone	1.031	3.80	.36	8.97	
	59	T. Stone	1.022	4.15	.52	6.58	2nd Prize.
	60	H. Thomson & Co.	1.022	3.95	.69	6.54	R.
	61	W. T. S. Tilley ..	1.034	3.15	.39	9.52	
179	62	T. Dodd	1.014	4.80	.54	4.64	
180	63	E. Wellington ..	1.021	4.70	.48	6.16	2nd Prize.

XIII.—THE SOCIETY'S NATURE STUDY EXHIBITION.

By H. M. Cundall, I.S.O., F.S.A., Steward.

The exhibits in this section were restricted to the educational bodies and residents in Devonshire, the county in which the Society's Show was held, and in those counties surrounding it, viz., Cornwall, Dorset, Gloucestershire, Somerset and Wiltshire.

It is to be regretted that, in the promotion of this Exhibition, the Society did not receive any material assistance in the organization of collective exhibits either from the Educational Authority of the city of Exeter or that of the county of Devon, for experience gained from similar exhibitions held in former years has proved that such help has greatly enhanced the educational value of the exhibits. Nevertheless, many of the schools individually contributed specimens of their students' work, and, although the exhibition was not so extensive as those held on previous occasions, the work shown by the pupils, taken as a whole, was of a high standard.

The Barnstaple Education Committee contributed a collective exhibit, in which the nature note-books, especially those of the girls attending the cookery course, evinced the results of good practical teaching.

The drawings of trees, in early and late spring, and other studies from nature, by the boys of Bathford National School, especially a drawing of a kidney bean by A. Moon, aged 12 years, were exceptionally good. The pen and ink sketches of trees and shrubs of the Almer School, Blandford, were well drawn.

Four schools in Exeter sent examples of their work; the note-books, containing specimens of wild flowers collected by the students of St. Thomas's Girls' School, evidenced intelligent instruction, but the use of the Latin, instead of the local names, was too frequent. Wild flowers collected and preserved by the pupils of Exwick Council School, and studies of trees in winter and early spring from the Mint Boys' School were shown. A large number of drawings in water colours from nature by the boys of Newtown School were for the most part well executed.

The brush work by both boys and girls from St. John's Schools, Weston-super-Mare, was good.

Certificates were awarded to all these Schools, besides several others.

Under Group E, *Simple apparatus and original diagrams made by teachers of any grade*, Mr. J. F. Bramwell, of Exeter Mint Boys'

School, showed an apparatus for holding twigs, whilst drawings are being made from them, and a high relief-map of Devon. Mr. W. H. Collins, of Bathford National School, contributed Nature Study diagrams in chalk.

Mr. F. A. G. Drake, of Exeter Newtown Boys' School, sent an electrical machine and accessories used in the school for illustrating the effects of static electricity, thunder, and lightning. Mr. W. Smitham, of Exeter Newtown Boys' School, showed apparatus for illustrating lessons in water power. Mr. F. V. Dutton, Devon County Education Committee, sent a collection of turfs from various soils in Devon to show changes in the herbage produced by fertilisers.

Although not coming strictly within the scope of Nature Study a most interesting exhibit, consisting of specimens of metal work and wood work made by blind students in connection with the Royal Albert Memorial University College, Exeter, was exceptionally admitted. The specimens were executed with great neatness, and showed the results of successful manual training of the blind.

XIV.—THE SOCIETY'S FORESTRY EXHIBITION.

By George Marshall.

Now that planting is being carried out in this country on a larger scale than formerly, the Government has moved in the right direction in establishing Forestry Schools and in acquiring land in Argyllshire for demonstration and experimental planting. Hopes are also held out of further monetary assistance which may possibly have some influence also upon the unemployed question.

The Forestry Exhibition held in connection with the Bath and West and Southern Counties Society's Show at Exeter, was as usual full of attraction to those interested in the subject it illustrated, whilst the exhibits were as instructive and as comprehensive as ever. The exhibitors in the class for a general collection of exhibits illustrative of Forestry deserve a high mead of praise. No one who has not the knowledge and experience necessary for the work of collecting and arranging the various specimens can fully realize how much time and patience this involves. Fresh diseases are continually being discovered, and the Forester has an anxious time while racking his brain to discover a remedy which will save the young plantation upon which so much time and money have been expended.

It is to be regretted that the new class for a pure Larch or mixed plantation of not less than five acres in area, and of not less than five or more than 10 years' growth, did not meet with any response, probably through being confined to Devon. This competition should be appreciated, for although the prize plantations, owing to their distance apart, may not be seen by many, the reports of the Judges would be very instructive and much appreciated by Foresters and others.

The classes and exhibits were as follows :—

Class 1.—*For a General Collection of Exhibits illustrative of Forestry.*

There were six exhibitors, the premier honour again going to the Duke of Wellington, of Stratfieldsaye House, Mortimer, who exhibited a magnificent collection, consisting of 120 transplants in pots, about 12 specimens of creosoted posts and scantlings mostly hardwoods, seven planks of coniferous timber, including *Abies Concolor*, *Auricaria imbricata*, *Wellingtonia*, *Tsuga Albertiana*, *Librocedrus decurrens*, *Austrian Pine*, *Almond*, and *Quercus rubra* ; about 80 micro-photographs of English timber sections, 50 transplants with notes as to where to plant them, 12 cases of foliage of conifers, specimens of damage to trees by honeysuckle, Larch Canker (*Peziza Wilcomii*), White felted Coccus (*Crypto Coccue Fagi*) affecting Beech timber, damage to Oak by Goat Moth, damage to Willow by Willow Wood Midge (*Cecidomajia saliciperda*), specimens of good and bad pruning, two cases of British Birds (one destructive and one beneficial to Forest Trees), a very fine collection of insects injurious to Forest Trees, also of Cones and Seeds, specimens showing suppression of lateral branches by close planting, photos of plantations with their various ages, about 100 sections of Deciduous and Coniferous Timber, and many other exhibits too numerous to mention in detail.

The 2nd Prize (Silver Medal) was awarded to Miss Talbot, Margam Park, South Wales, for a very instructive collection of exhibits, comprising Scotch Fir killed by the Honey Fungus, young trees damaged by rabbits, Scotch Fir damaged by goats, Scotch Pine damaged by Pine Canker, specimens of Larch Fir shooting from the stems of trees cut off after being badly damaged by fire, three creosoted posts—one Beech, one Birch, one Poplar, creosoted by absorption when green; plan of creosoting Tank showing system of creosoting at a gentle regular heat for 48 hours, not allowing liquid to boil; sections of posts used in creosoting experiments by Dr. Voelcker, who attempted by chemical analysis to get definite results without success, but stated that although the centre of the wood treated appeared not to be affected it had been protected and rendered unsuitable for the development of fungoid growth.

The 3rd Prize (Bronze Medal) was awarded to the Rev. W. P. Bastard, Kitley Court, Devon, for a collection of sections showing damage by ivy, birds and shakes, and other exhibits.

Class 2.—*For Boards of Scots Pine* (*Pinus sylvestris*).

1st Prize (Silver Medal) was awarded to Sir C. T. Dyke Acland, and the 2nd Prize went to Earl Beauchamp, K.C.M.G., the Duke of Wellington being highly commended, and the Rev. W. P. Bastard commended.

CLASS 3.—*For Boards of Larch* (*Larix europea*)

The 1st Prize was awarded to SIR C. T. DYKE ACLAND ; the 2nd Prize to LORD CARNARVON, while the REV. W. P. BASTARD was highly commended.

CLASS 4.—*For Boards of Norway Spruce* (*Picea excelsa*).

The 1st Prize was awarded to the REV. W. P. BASTARD ; the 2nd Prize to the EARL OF CARNARVON, SIR C. T. DYKE ACLAND was highly commended, and the DUKE OF WELLINGTON commended.

CLASS 5.—*For Boards of Ash* (*Fraximus excelsior*), *Oak* (*Quercus robur*), *and Elm* (*Ulmus campestris*).

The 1st Prize was awarded to SIR C. T. DYKE ACLAND ; the 2nd Prize to the EARL OF CARNARVON, while the exhibits of the DUKE OF WELLINGTON were highly commended, and those of the EARL OF BEAUCHAMP commended.

CLASS 6.—*For Boards of any three non-Coniferous Timber other than the above.*

The first Prize was awarded to SIR C. T. DYKE ACLAND for collection of nine species ; 2nd Prize to the DUKE OF WELLINGTON, while the EARL OF BEAUCHAMP was highly commended.

CLASS 7.—*For a 9ft. Field Gate manufactured upon an Estate from Home-grown timber, shown in working order.*

The 1st Prize was awarded to EARL FORTESCUE, and the 2nd Prize to EARL BEAUCHAMP.

CLASS 8.—*For Exhibits illustrative of Forestry contributed by Institutions or by Estates not desirous of entering in competitive classes.*

The following were highly commended : SIR C. T. DYKE ACLAND, for eight boards of rare Conifers ; the BRISTOL MUSEUM OF NATURAL HISTORY, and UNIVERSITY COLLEGE, Bristol, for a magnificent Collection of life history groups of injurious insects ; the NATIONAL FRUIT AND CIDER INSTITUTE, Long Ashton, Bristol, and the ROYAL BOTANIC GARDENS, Kew, for a very varied and instructive collection.

It is to be hoped that the Society will continue a Forestry Exhibition, for it is deserving of every encouragement. I think that another attempt should be made to obtain support for Plantation Classes, which would afford excellent object lessons.

XV.—THE SOCIETY'S PRUNING DEMONSTRATIONS.

By Chas. Berry, F.R.H.S., Devon County Instructor in Horticulture and Demonstrator in Forestry at the Society's Exeter Meeting.

On the second, third and fourth days of the 1909 Show at Exeter, the Society's Forestry Committee, acting in concert with the Devon County Education Authority and the National Fruit and Cider Institute, arranged demonstrations in the Show Yard for the purpose of showing the correct method of pruning apple trees, more especially old and neglected ones, thereby pointing the way to a very necessary reform of which very many of the Devon orchards stand in need. It may here be mentioned that Devon possesses 27,000 acres of orchards—the largest County acreage of such trees in England. The Committee were the better able to carry out this useful work through the kindness of Sir Thomas Acland, who not only provided trees for the purpose, but also contributed liberally towards the cost of the demonstrations.

At the suggestion of Mr. Lipscomb, the Society's Forestry Steward, five big trees were removed in November, 1908, from Killerton, five miles from Exeter, to the Show Ground, where they were planted for the purposes of the demonstrations. The removal of trees so large was costly and difficult work and entailed some danger to ordinary street traffic, the top of one tree being 25ft. by 22ft. through, and another 20ft. by 19ft. The circle of the stem of the largest tree was 4ft. 9in., and that of the smallest was 1ft. 6in. The carting was consequently done after midnight, one tree on each wagon. Smaller trees (about ten years old from planting) were used for grafting lessons for the purpose of showing how to renew an orchard of poor varieties by grafting more profitable fruit-bearing kinds upon well-established trees. Of these trees, two, each about eight years old from planting, were headed back last year. One was grafted with Blenheim Orange and the other with Lady Henniker, two very valuable apples. These heads had made very strong growths during the year, and were quite healthy.

The National Fruit and Cider Institute sent ten cider apple trees for planting, similar to those distributed in the Autumn of 1908, to the contributing County Councils for Model Cider Orchards, and the Devon County Council had a number of trained wall-fruit trees to show how to utilise the walls of farm-buildings for the growth of good apples, pears, peaches and plums.

I myself sent some apple trees which were taken up in the Autumn of 1908 and potted, the pots being then sunk below the

rims in my garden. These trees were full of well-set apples, viz., Cox's Orange Pippins and Lane's Prince Albert.

On Thursday morning, May 27, the demonstrations were begun by the thinning of the first tree, this work being carried out, and many questions answered, in seventeen minutes. The average time spent in pruning fairly large trees last winter was fifteen minutes, thus showing that a farmer directing his men carefully could in a day or two make considerable progress in thinning a crowded orchard.

Farmers too often neglect orchards. Twelve tons of farmyard manure ; 3 cwt. of Superphosphate ; 3 cwt. Kainit ; and 8 cwt. of Basic Slag, per acre, would do more than all the spraying could, to keep fruit trees vigorous and therefore clean. Starved orchards, however much sprayed, are calling aloud for suitable food, viz., dung to promote the growth of wood, and chemical manures to make fruit buds develop on that growth. Old trees require farmyard manure, and young trees Superphosphate and Kainit. In the case of young fruitful trees add 1 cwt. of Nitrate of Soda per acre, but in that of young wood-bearing trees Basic Slag and Kainit are sufficient, viz., Slag for back-bone, and Kainit for clothing the back-bone with ripe growth, which must end in producing blooms.

One of my questioners said that Cox's Orange Pippins cankered badly on a thin, gravelly, or heavy clay soil, and asked how this could be remedied. The answer was : Break up the sub-soil and if gravel, mix heavy soil with it, for apple trees like heavy soil if drained. If the sub-soil is lime-stone, take away the stone lower down, and mix, with the smaller stones, way-side soil and farm-yard manure ; but not close to the roots. The surface soil is rich enough, and if the lower soil be enriched, Cox's and most other apple-trees will, speaking generally, soon begin to thrive, and be free from canker. Plant trees within two or three inches of the surface, and hoe the soil three or four times a year for five or six years. Do not cart way-side soil (filth) and put over the roots and around the stems. If you do, you infest the orchard with weeds ; and shut out from the roots the sun's power of assisting them to make rapid and ripe growth. Prune close to the stems and arms ; do not leave snags, for they cause the heart of the tree to die by disease. Wayside soil is good after six months' dressing with new lime or salt, and can, with profit, be spread evenly over the whole orchard ground. Make the roots comfortable and a healthy tree will result.

On Friday, May 28, there were further demonstrations. The same persons, in many cases, came again and asked many questions arising out of the previous day's work, and for about two and a

half hours there was a crowd of interested people, several Counties and Education Committees being represented among them. The chief interest was centred in the treatment of upright-growing limbs and cross-wood. Where cross-wood grows, friction, more or less constant, takes place. This is detrimental to the tree and should be prevented. As to the upright, sky-growing branches, these should be removed, because sap flows more easily upwards than in other directions, leaving more wood-buds than fruit-buds. The reason for this is that as the botanists say, "the deposition of sap" in a bending branch is slow but does its work better, and this results in less growth but more ripened wood. Bending branches, as in the pot-apple tree exhibited, make little growth but much fruit. That pot-tree was not pruned, but tied down by the cords attached, thus making the flow of sap more steady and better for the production of fruit.

The cutting off of branches should leave no projection, that is, the entire branch should be cut off, then the sawn bark should be pared with a sharp knife—a flat not a bevel cut, because the whole of the bark is wanted to bring sap to the inner wood where cut off. Many snags (projections) showing the results of bad pruning were exhibited.

Before the sap rises in the Spring the head of a healthy tree should be cut back if it be a tree less useful than one you wish to grow. The "heading-back" as it is called, consists in cutting the limbs, or branches, back to about 2ft. from the base or fork of the tree. The sap rises freely about April or May. Again cut back two or three inches at least below the first cuts in order to have a moist surface with which to place the graft in contact. Crown-grafting and Whip-grafting (splice) were shown and in some cases were performed by those who came for instruction. Many questions were asked and answered.

On Saturday, May 29, the last demonstrations were given, and these consisted in further lessons on pruning and grafting, grafting-wax being used instead of clay.

I would like to express my thanks to Mr. Lipscomb, of Margam Park, Wales, the Forestry Steward, who took much trouble to make these demonstrations useful, and gave me very great assistance.

XVI.—THE SOCIETY'S LACE EXHIBITION.

In order to promote the cottage industry of Lace Making in Devon, the Society determined to hold an Exhibition of Lace, and the Lace Committee of the Devon County Council not only undertook to organize the exhibition, but also to award prizes, the competition being confined to pupils in the Devon County Council classes. Miss Mildred Iremonger and Miss E. Herbert, M.D., kindly acted as judges, and made the following awards :—

Class 1.—*Lengths of Lace.*

1st Prize.—Misses E. Carter, S. Pile, E. Pile, and M. Mayne, of Bicton.
2nd Prize.—Mrs. Durrant, Newton, Westlake, and Rogers, of Beer.
3rd Prize.—Miss E. Carter, of Bicton.

Class 2.—*Handkerchiefs or Chalice Veils.*

1st Prize.—Miss Ethel Kemp, of Awliscombe.
2nd Prize.—Miss Mabel Mayne, of Bicton.
3rd Prize.—Mrs. Pease, of Belstone.

Class 3.—*D'Oyleys.*

1st Prize.—Miss Eda Russell, of Awliscombe.
2nd Prize.—Miss Beatrice Knight, of Sampford Courtenay.
3rd Prize.—Misses L. Gush, L. Perry, and G. Newton, of Branscombe.

Class 4.—*Fans.*

1st Prize.—Six Members of the Children's Class, Woodbury.
2nd Prize.—Mrs. May, of Sampford Courtenay.
3rd Prize.—Mrs. Godfrey, Mrs. Havel, and Misses A. Marks and A. Hitchcock, of Woodbury.

Class 5.—*Sprays.*

1st Prize.—Miss Ethel Kemp, of Awliscombe.
2nd Prize.—Mrs. Havel, of Woodbury.
3rd Prize.—Miss Eda Russell, of Awliscombe.

The Judges appended the following report to their awards :—

> "The work done by the pupils of the County Council Classes reflects the greatest credit on the teaching. The manual work reaches a very good average and in certain specimens an extremely level one.
>
> "The designs, however, need improvement. There is a tendency to produce the flat Belgian type of lace, and this should be avoided. The small forms and raised work, etc., characteristic of Honiton lace, should be encouraged."

Specimens of old Italian and Belgian lace were lent by Mrs. Kennet Were and Mrs. Bernard, and samples of modern lace by Mrs. Fowler, of Honiton and the East Devon Cottage Lace Industry.

The Exhibition proved attractive to many who are anxious that one of the oldest of the Devonshire industries should be supported, and the work executed by the Devon County Council Classes under the able superintendence of their instructress, Miss Ward, met with general approval.

XVII.—THE NATIONAL FRUIT AND CIDER INSTITUTE.

By B. T. P. Barker, M.A., *Director, and John Ettle, F.R.H.S., Superintendent of the Fruit Department.*

The present Report deals with some of the investigations carried on at the Institute during 1908-9 in the cider-house, the laboratory, and the fruit plantations. It has been found difficult to make it much more than an interim report, so far as the majority of the investigations are concerned, since by their nature several seasons' work is required before definite conclusions can be established. It has also been a matter of difficulty to avoid the quotation of a mass of statistics; but they have been reduced as far as possible, and those quoted may be regarded as typical selections to illustrate the various points under discussion. Many subjects under investigation have not been dealt with here, in most cases because the work is not sufficiently far advanced to furnish conclusions of value.

The Experimental Cider Work.

Vintage Varieties.

The experimental work in cider-making on a practical scale consisted largely, as in previous seasons, of variety trials. Many varieties not previously tested were procured, some of which gave results of much promise. The list of varieties obtained was as follows:—

Sharp Varieties.—Backwell Red, Broad Styre, Bromley, Buck's Kernel, Cap of Liberty, Crimson King, Forest Styre, Frederick, Greasy Pippin, Hackett's Kernel, Kingston Black, Lady's Finger, Lambrook Pippin, Middle Mill Brandy, Newcomen's, Overton Red, Page's Yellow, Passey's Late Crab, Passey's Red, Prince of Wales Crab, Red Soldier, Reynolds' Kernel, Skyrme's Kernel, Underleaf, Yellow Styre.

SWEET VARIETIES.—Ansell, Ashton Brown Jersey, Bran Rose, Loram's Sweet White, Morgan Sweet, Slack-ma-girdle, Sweet Alford, Yelland's.

BITTER-SWEET VARIETIES.—Appleridge Pippin, Ashton Bitter White, Ashton Early Red Jersey, Ashton Russet Jersey, Ashton White, Belle Norman, Brown Snout, Cherry Norman, Chisel Jersey, Cummy Norman, Knotted Kernel, Prince Albert, Pytheres, Royal Jersey, Royal Wilding, Spreading Norman, Strawberry Norman, White Jersey, Yarlington Mill Jersey.

PEARS.—Blakeney Red, Butt, Oldfield, Pint.

The characteristics of the individual ciders and perries made from these varieties would occupy too much space, if given in detail, but they may be obtained upon application and will be published in the next Annual Report of the Institute. The general results correspond closely with those obtained during the course of the work upon similar lines in previous seasons, which have already been considered at length in the previous Reports of the Institute, and need not, therefore, be recapitulated. Additional information has been forthcoming on several problems, notably on those concerned with the variations in quality due to the influence of soil and season; and this will be discussed in the course of this Report as the various subjects concerned are dealt with.

The work on single variety ciders and perries has not only furnished valuable information on the general problems of cider and perry-making, but it has also built up a knowledge of the respective values and uses of the majority of the best known vintage varieties, of many less widely grown, and of some practically unknown kinds. We are, therefore, now in a position to utilise these varieties to the best advantage, so far as the present state of knowledge of the science of cider-making allows. It has been found possible to divide the varieties into a series of groups, each of which may be represented by a more or less well-known variety as the type; and the method of treatment recommended for this sort may be taken as suitable for the other individual members of the same group. Thus, for instance, one of the three main classes of cider apples, the "sharps" or "sours," may be divided up into a series of groups, represented respectively by Cap of Liberty, Kingston Black, Fair Maid of Devon, and Underleaf, with others which need not here be specified, as the type varieties. The Cap of Liberty group is normally characterised by the juice containing a comparatively large percentage of malic acid and a moderately large percentage of tannin, and fermenting also at a comparatively slow rate. Apples of this group are adapted for the production of a sweet cider of good quality after suitable blending. The kind of blending required is the addition of about equal parts of a variety of the class of "sweet" apples, belonging to a slow-fermenting group—which

may be typified by Sweet Alford—and of a variety of a slow-fermenting, pronounced "bitter-sweet" type—of which Royal Jersey or Strawberry Norman may be quoted as examples: or an equally satisfactory blending may be obtained by the use of about two parts of a slow-fermenting, mild "bitter-sweet" apple of the Horner type. The Kingston Black group of sharp apples, while normally resembling the Cap of Liberty group in the slow rate of fermentation of the juice and the possession of a medium percentage of tannin, shows, on the other hand, only a medium percentage of malic acid. Its members are, therefore, also adapted for the production of a sweet cider; but, since the acidity is only moderate, for many palates blending is not required. For those who prefer a less brisk cider the same lines of blending may be followed as for the Cap of Liberty group, but not more than half the quantities of "sweet" and "bitter-sweet" apples given in connection with that case are here necessary. Well-known members of the Kingston Black group which may be mentioned are Cowarne Red, Skyrme's Kernel, Porter's Perfection, and Lambrook Pippin; while Foxwhelp, Red Soldier, Dufflin, Red Butcher, and Forest Styre are of the Cap of Liberty type. The Underleaf and Fair Maid of Devon types correspond respectively with the Cap of Liberty and Kingston Black types so far as the normal degree of acidity of the juice is concerned; but they differ in that the normal percentage of tannin is low, and the normal rate of fermentation of the juice rapid. The kind of blending necessary will correspond relatively with that for the two aforementioned examples; but "sweet" and "bitter-sweet" varieties with rapid-fermenting juices should be used, and the proportion of "bitter-sweets" required will be higher on account of the deficiency of tannin in the sharp apples of these groups. Members of these groups are only adapted naturally for the production of dry ciders. Most of the dessert and culinary varieties of apples fall into the Fair Maid of Devon group, while Bromley and Reynolds' Kernel may be classed with the Underleaf type.

A complete classification of all the varieties of apples examined at the Institute is now being drawn up on the lines thus briefly outlined, and will be ready for publication shortly. It is not to be expected that it will solve all the difficulties as to the methods for utilising and blending apples for cider, or that it will be found to hold good in every instance. With more complete knowledge of the varieties dealt with, some will doubtless be found to be grouped incorrectly. Some of the groups themselves may require modification. Revision will certainly be necessary from

time to time; while the addition of other varieties not yet investigated will gradually make the scheme more useful and complete. In spite, however, of its necessarily tentative nature it can hardly fail to prove of real value to every maker who wishes to utilise his vintage fruit to best advantage. It is not that the scheme as first published is likely to be of immediate benefit to more than the few makers who may be fortunate enough to have to deal mainly with varieties already included in the list. On account of the very large number of varieties utilised for cider-making in different districts it will certainly be found that, in the average case, at the most only a few of the varieties with which the maker has to deal will be found in the classified list. To extract full value from such a scheme of classification it will be necessary for individual growers and makers to submit to the Institute for examination varieties not already included, so that they may be referred in due course to their proper place in the scheme. Thus the future development of the scheme rests very largely in the hands of the makers themselves, since it is impossible for a central station like the Institute to get directly into touch with the local problems of any district, unless those resident in the locality concerned take their part in the matter. The Institute is always ready and willing to examine any varieties submitted, so far as time and other work permit. This is the first systematic attempt to thoroughly classify for vintage purposes the vintage fruit of this country, and it is hoped that all growers and makers will endeavour to assist in making the work as complete and representative as possible.

In this manner an endeavour is being made to turn to practical use for cider-makers the knowledge of individual varieties which has been gained during the course of this single-variety work. It is, however, a matter of great difficulty to decide what should be considered the normal qualities of any individual variety under investigation, and for what purposes it is best adapted. This difficulty is created by the fact, known to every cider-maker, that a variety rarely gives exactly corresponding results in any two consecutive seasons, even if the samples examined are taken from the same tree. The matter is still further complicated by soil and other local influences, the results obtained with samples of the same variety taken from different localities, or even from different orchards in the same locality, differing, often materially, even in the same season. In order that our knowledge of variety characters may be based upon a thoroughly satisfactory foundation, it is necessary that the influences of the various factors at work in determining the quality of the fruit for vintage purposes should be understood, and the

relative parts played by each in producing the result of their combined action elucidated. Hence it has been found necessary to investigate separately, as far as possible, the influence of some of these factors, and, when suitable opportunity arises, others will also be studied. The amount of time required for such work is considerable ; and, since in many cases the factor of seasonal influence must be eliminated, the same ground must be covered for a number of successive years before any conclusions can be considered fully substantiated. Much of the work also has to be crowded into a comparatively few weeks,—that period of the year when the fruit is available for cider-making,—so that it has to be run concurrently with the experiments on purely practical methods. It is evident, therefore, that owing to the lack of assistant scientific staff at the Institute, the work in the one direction can only be done at the expense of the other. Since, however, as was stated in last year's report, it has been demonstrated that the dominant factor in determining the quality of a cider is that of the quality of the fruit, and since there is at the present time no subject connected with cider-making which has received so little attention, and on which knowledge is so urgently required, as that of the influence of those factors which affect the quality of the fruit for vintage purposes, the attention which is now being given to that side of cider research ought not to require further justification, although its connection with practical cider-making may not appear to the maker at first sight to be very close, and may not, therefore, appeal to him to the same extent as experiments on purely practical methods. It may further be pointed out that, until scientific knowledge of the groundwork of the subject is attained, efforts to improve the practical methods at present accepted as the most satisfactory, are greatly handicapped by the necessity of working in the dark with regard to the manner of operation of certain essential factors.

The Variation in Quality of a Vintage Variety.

Before dealing with the results obtained from the investigations of the behaviour of those factors which have already been studied at the Institute, it will be necessary to show in what directions and to how great an extent individual ciders made from the same variety of apple differ. Some of the features have already been considered in earlier Reports, so that a brief summary only need be given here.

The chemical composition of the cider is one of the most striking features to show variation. The amount of sugar present is espe-

cially of practical importance, and frequently differs greatly, not only in the fresh juice, but also in the mature cider. Thus, of a number of Kingston Black ciders, made during 1908-9 at the Institute, the highest specific gravity obtained in the fresh juice was 1.075, which is equivalent, approximately, to 16¼ per cent. of sugar, while the lowest gravity was 1.050, representing only an approximate percentage of sugar of 10. Assuming both ciders to be completely fermented, the difference in the amount of alcohol in the finished products would be as much as 3 per cent. Since, however, the rates of fermentation of the different juices also vary considerably, the original amounts of sugar in the fresh juices do not necessarily correspond relatively to those in the finished article, and small differences in the original juices may be considerably enlarged later. A very good example may be quoted from the Report for 1906, where two lots of Strawberry Norman were tested on a small scale in the laboratory, and allowed to ferment naturally under identical conditions until fermentation ceased. The fresh juices had specific gravities of 1.051 and 1.060 respectively, representing a difference of about 2 per cent. of sugar. Twelve months later the gravities of the respective ciders were 1.013 and 1.035 respectively, the difference in the sugar present being approximately 5½ per cent. Differences of a similar character may be shown also for the other constituents of cider, both in the fresh juice and the mature cider. The accompanying table of analyses of Kingston Black juices, made during the autumn of 1908, contains a selection of results to illustrate these differences in the fresh juice.

KINGSTON BLACK ANALYSES, 1908.

Locality where Grown.	Percentage Composition of Fresh Juice.		
	Specific Gravity.	Malic Acid.	Tannin.
Long Ashton, Somerset. A. ..	1.075	.50	.254
" " " B. ..	1.062	.76	.272
Berkeley, Gloucester ..	1.066	.39	.172
Easton-in-Gardano, Somerset	1.050	.44	.152
Ash, Devon	1.068	.44	.242
Martock, Somerset ..	1.071	.67	.192
Newnham, Worcester ..	1.058	.53	.186
Budlake, Devon	1.056	.46	.116

The differences in the amounts of malic acid and tannin shown in this table are sufficiently marked to influence materially the flavour of the mature ciders. Other variations in flavour, due to

characters which do not lend themselves so easily to expression by chemical analysis, were even more marked. For instance, the Kingston Black ciders made from Devon-grown fruit were soft on the palate, but lacking in briskness, body, and general character; those from South Somerset fruit were soft, fruity, and full of body, but of a heavy type; those from North Somerset fruit were brisk and full-flavoured, but decidedly harsh; and those from Worcester and Hereford fruit were brisk, fruity, and of fair body, softer than the North Somerset type, but less heavy and harsher than the South Somerset ciders. The flavour, apart from the degree of sweetness, therefore, varies greatly.

The natural degree of sweetness of a mature cider depends on the rate of fermentation of the juice. Of course the methods of manufacture adopted can materially affect the sweetness also; but, since they are artificial in character, and bear no relation to the quality of the fruit or cider as it is determined by purely natural processes, they do not come into the question in this connection. The example of the two Strawberry Norman ciders, already quoted in connection with the variation in sugar content, illustrates the extent to which the rate of fermentation can vary in juices of the same variety, the fall in gravity in the one case being from 1.051 to 1.013—a drop of 38 points—in a year, and in the other case from 1.060 to 1.035—a drop of 25 points—in the same period of time. It is, however, more strikingly marked in the following cases, which occurred during the past autumn. Two samples of Kingston Black juice, the one obtained from fruit grown on old trees and the other from fruit grown on young trees at the Institute, were kept at a temperature of 27° C. The specific gravity of the fresh juice in the former case was 1.047, and in the latter case 1.045. After five days the specific gravity of the former stood at 1.038, and of the latter at 1.008. Variations in the rate of fermentation may, therefore, under some circumstances, be as great between juices of the same variety as between juices of different kinds of apples.

The clearing property of the cider is another feature showing considerable variation. Experiments with the juice of Ashton Early Red Jersey apples taken at different stages of ripeness of the fruit showed that the cider made from the unripe fruit cleared slowly, and the fining was accompanied by the deposition of a comparatively small amount of mucilaginous material. The cider from perfectly ripe fruit cleared quickly and thoroughly, the juice "dropping bright" at an early stage, and much mucilaginous material being thrown down in the form of a clot. The cider from over-ripe fruit generally cleared very slowly and irregularly, some haziness

persisting; while the mucilaginous material thrown down was large in amount and flocculent in character. These results hold good generally for apples of the sweet and bitter-sweet classes with low acidities. Sharp apples behave similarly as regards the rate and efficiency of clearing; but the behaviour of the mucilaginous constituents differs somewhat.

The keeping qualities of ciders made from the same variety also show great differences. The varying extent of resistance to sickness and other disorders was very well illustrated during the past summer at the Institute by the different Kingston Black ciders made there the previous autumn, some being very susceptible to sickness and others remaining unattacked, or only slightly attacked, and that with difficulty. While the evidence on this point is decisive as far as it goes, it is not yet sufficiently precise to warrant definite conclusions as to the causes which predispose some ciders more than others to attack by such disorders, there being evidently other factors, in addition to the character of the cider, playing an important part.

Such, then, are the most striking points of variation in ciders made from the same variety of apple, which have been noticed during the course of the work at the Institute. There are many other features in which variation is shown by the same variety under different conditions; but these are more of a horticultural than a purely vintage character, and it is not proposed to consider here any but those affecting more or less directly the vintage qualities of the fruit and cider. The differences in character which have been described are so marked that it seems at first sight to be almost impossible to decide absolutely the value of a variety for vintage purposes. They certainly illustrate the difficulties which must be faced in making a definite decision. But it must be recognised at the same time that these differences represent generally extreme cases, and that normally there is much greater correspondence in the characters. Some of the differences also are due to factors to some extent within the grower's or maker's control. In spite of these differences there is undoubtedly in average cases a fair measure of consistency in the behaviour and characters of any individual variety, as has been pointed out in previous Reports. The real difficulty lies in deciding how far the characters which are observed in any particular instance are typical of the variety, and how far they are abnormal; and it is in this direction that the investigations about to be described are especially important.

Having thus pointed out the differences which may be met with, the influence of the various individual factors affecting quality may be considered.

Factors Influencing the Quality of Vintage Fruit.

The Degree of Ripeness of the Fruit.—It has already been proved that the degree of ripeness of the fruit at the time of cider-making has a great deal to do with the quality of the product, not only the chemical composition of the juice, and consequently the flavour, being affected, but also the rate of fermentation. In order to get the best results from the fruit, therefore, it is important for the maker to mill it when it is at its period of highest quality. In practice, however, it is difficult to decide with certainty when this point is reached. In the hope that some definite information of practical service in this connection might be gained, a series of tests has been conducted at the Institute with fruit picked from one tree and made up into cider at intervals from the time when it was fit to be gathered from the tree until it began to decay from over-ripeness. The fruit selected was as even in quality as possible. The differences in the chemical composition of the fresh juices and in their rates of fermentation are given in the following table :—

Name of Variety.	Date of Pressing.	Specific Gravity of Juice.	Percentage Composition of Juice.		Rate of Fermentation. Average daily drop in Specific Gravity at 27 deg. C.
			Malic Acid.	Tannin.	
Red Vallis ..	Oct. 7	1.040	.66	.120	—
	Oct. 13	1.041	.69	.124	—
	Oct. 27	1.039	.75	.080	5.0
	Nov. 4	1.039	.66	.104	6.6
	Nov. 11	1.044	.80	.108	5.2
	Nov. 20	1.041	.72	.120	5.5
	Nov. 29	1.036	.70	.116	5.8
	Dec. 7	1.045	.61	.090	6.7
Red Butcher ..	Oct. 27	1.050	1.26	.148	2.1
	Nov. 5	1.051	1.68	.156	2.1
	Nov. 11	1.058	1.45	.108	3.8
	Nov. 20	1.057	1.52	.180	3.2
	Dec. 1	1.047	1.35	.146	4.4
	Dec. 7	1.052	1.20	.180	4.5
Kingston Black	Oct. 28	1.047	.65	.120	2.6
(old tree.)	Nov. 4	1.048	.60	.148	3.7
	Nov. 11	1.048	.50	.100	4.7
	Nov. 20	1.049	.49	.160	7.7
	Nov. 29	1.047	.46	.098	2.0
	Dec. 7	1.052	.57	.134	4.4
Kingston Black	Oct. 28	1.043	.68	.160	3.3
(young trees.)	Nov. 4	1.045	.48	.116	9.3
	Nov. 11	1.049	.46	.084	9.2
	Nov. 20	1.048	.43	.124	8.5
	Nov. 29	1.045	.40	.082	7.2
	Dec. 7	1.051	.46	.110	7.0

The results in these trials would undoubtedly have proved of more value if the series had been started earlier in the season. From their general tendency, and from what has been learnt by experience with other varieties during the past autumn, the course and time of ripening have been abnormal this season. In an average season none of the varieties utilised would be considered fit for pressing until late in November at the earliest. This season they were fit to press immediately after gathering; and the general course of the results quoted indicates that the fruit throughout ought to be considered, if anything, on the over-ripe side. It is not possible to draw any satisfactory conclusion as to the changes in chemical composition of the juice during the ripening period, since with each variety the results of the analyses are somewhat irregular and apparently bear no relation to the time of pressing. Probably the irregularity was accounted for to a great extent by the nature of the season, since the fruit kept very badly after being gathered and some of it wilted considerably, the loss of water in such cases tending to make the results fictitious. The behaviour of the mucilaginous constituents of the juices was more normal, and showed that the fruit at the start of the work was practically at the stage of perfect ripeness. The rates of fermentation, while presenting certain features not easy to understand in the light of previous results—notably the results for the Red Vallis juice of November 4, the Kingston Black juices of November 29 and December 7, from the old tree, and those from the young trees after November 11—show on the whole a decided acceleration from the start. There is little doubt that in each case the best cider would have been made from the fruit in its condition on about October 28, and that possibly still better results would have been obtained at a yet earlier date.

However inconclusive these results may have proved as regards the furnishing of definite information as to the influence of the degree of ripeness of the fruit upon the quality of cider, they certainly show the necessity of accepting with caution the results of a single examination of any variety. If, for example, the Kingston Blacks from the old tree had been examined only on November 20, that variety might have been regarded as of little value for the purpose of producing sweet cider on account of the high rate of fermentation; whereas the results for the other dates prove that it is well adapted for that purpose. In order to put the trial of any variety on a really sound basis, therefore, it is really necessary to obtain a supply of fruit direct from the trees immediately it is fit to be gathered, for examination in the laboratory at weekly or fortnightly intervals over a period of eight or ten weeks.

The Age of the Tree.—In the Report for last season the question of the influence of the age of the tree upon the vintage qualities of its fruit was discussed briefly in connection with the results which were obtained with Foxwhelp apples from trees of different ages. It was shown that the rate of fermentation of the juice from fruit taken from a 20-year-old tree was much more rapid than those of juices from a recently-grafted young tree and from a tree at least 60 to 70 years old: and it was suggested that the differences might be due to the difference in the vigour of growth of the respective trees. Not only did the rates of fermentation of the respective juices vary considerably, but there were also marked differences in their chemical composition. It was obviously not possible to draw any general conclusions on the matter from this single instance; and it seemed desirable to obtain further information, since, if there is any material difference in the vintage quality of fruit of the same variety from trees of different ages, it is important from the practical point of view not to mix such fruit together at the time of gathering. It is not, however, an easy matter to obtain much information on the subject, since young, middle-aged, and old trees of the same variety are rarely, if ever, to be found growing together under the same conditions: and it is clearly impossible to take for comparison the produce of trees growing in different localities, since the effect produced by local conditions could not be eliminated from the result. The most satisfactory information has been obtained from Kingston Black fruit grown at the Institute, one lot being taken from an old tree in the Old Orchard, and the other from five young 10-year-old trees in the Young Orchard. It was unfortunate that there was not sufficient fruit produced by each of the young trees to be dealt with separately throughout the course of the investigation, since, as will be seen from the accompanying table, there is reason to believe that the results from the mixture do not necessarily represent very closely those which would have been obtained from the individual trees. Enough fruit was obtained from each tree for a single test to be made, but in order to carry out a series of successive tests on the lines described in the preceding section dealing with the influence of the degree of ripeness of the fruit, it was necessary to mix the remainder. The results, therefore, cannot be taken as entirely independent of the factor of the individuality of the tree; and, moreover, they do not probably represent even an average for the five trees concerned, since the quantity of fruit used from each tree was not the same, on account of the smallness of the crop. They do, however, probably serve for the comparison of the influence

of youth and old age as nearly as can be obtained at the present time, since all other conditions, apart from minor soil variations which are bound to occur even in soils of essentially the same character in adjacent orchards,—as in the present case,—were identical.

The results of the examination of the fruit from the young and old trees at different stages of ripeness, have already been given in the table in the preceding section. Those in the following table supplement these and show the extent of the variation in the case of the four individual young trees on the single occasion when their produce was examined separately.

THE COMPOSITION OF KINGSTON BLACK JUICES FROM YOUNG TREES.

Number of Tree in Young Orchard.	Date of Pressing.	Specific Gravity of Juice.	Percentage Composition of Juice.		Rate of Fermentation. Average daily drop in Specific Gravity at 27 deg. C.
			Malic Acid.	Tannin.	
1. ..	Nov. 9	1.047	.47	.054	5.0
2. ..	Nov. 9	1.042	.53	.074	7.5
3. ..	Nov. 9	1.047	.53	.060	10.5
5. ..	Nov. 10	1.049	.50	.086	9.2
4-Yr. old Tree in Nursery ..	Nov. 10	1.046	.43	.044	11.0
Results for corresponding date from preceding table.					
Young trees mixed	Nov. 11	1.049	.46	.084	9.2
Old tree ..	Nov. 11	1.048	.50	.100	4.7

There can be little doubt from the data given in this and the preceding table that there is, in the majority of cases at least, an appreciable difference in the rates of fermentation of young-tree and old-tree juices taken at any given dates ; and it is also clear that, throughout the whole period over which the investigation extended, the former was more rapid than the latter Hence there is, if these results are taken in conjunction with those dealt with in last year's Report, a strong presumption in favour of the view that the vintage quality of the fruit of any tree varies according to the age of the tree ; and that, since the rate of fermentation is relatively slow for old-tree juices, the cider produced from the latter will tend to be sweeter and of better flavour than that from young trees. In other words, a tree does not reach its highest point of vintage quality until late in life.

It will be noticed that the variations in the chemical composition

of the juice are comparatively slight, the results in this way differing from those obtained last year with the Foxwhelp juices. Seeing that it has been found that in many respects the results for the 1909 juices are quite abnormal, doubtless owing to the unusual nature of the season, any conclusions on questions affecting the chemical character of the juice must perforce be postponed until the results of similar work in succeeding and more normal seasons show to what extent allowance must be made for this factor. From past experience, it is clear that the specific gravity of the Kingston Black juices has averaged in 1909 at least 10 points lower than the normal; while the percentage of tannin is also very low and the rate of fermentation higher than usual. Somewhat curiously, the acidity has not differed much from the normal. Similar features have been noticed for almost all the other varieties examined, in some cases to a much more pronounced extent. Bitter-sweet and sweet varieties, however, in contradistinction to the sharp varieties have shown, as a rule, acidities decidedly above the average.

When comparing the results for the young trees in the foregoing table, some allowance ought probably to be made for differences in treatment of the trees. Tree 1 has had the grass removed around the base of the stem for a radius of 4 feet 6 inches, and Trees 2 and 5 for a radius of 3 feet; while the grass has been allowed to grow up to the base of the stem in Tree 3. This distinction in treatment has been in operation since the spring of 1905, one season after planting, each tree for its first season having had the grass cleared for a radius of 3 feet. Since it has been amply proved by the Woburn experiments, and verified by other experiments at the Institute and elsewhere, that grass exerts a prejudicial influence on the growth of the tree, and also affects both the colour of the fruit and its time of ripening, it is probable that the results quoted for the individual trees have been influenced by the grassing experiments; but further consideration of this point may be deferred until the results for other varieties are dealt with in a subsequent Report.

Little can be said at present as to the ultimate cause of the difference in vintage qualities of the fruit of young and old trees. That it is concerned very closely with the vigour of growth appears highly probable; but, in comparing the results for any definite date, some allowance should undoubtedly be made for the different stages of ripeness of the fruit. The fruit from young trees is evidently, as a rule, some distance ahead of that from old trees as regards condition of ripeness. The better exposure of the fruit to the sun on young than on old trees, and consequently its higher

colouring, must also have a moderating influence on the rate of fermentation.

In view of these results those who desire to make sweet cider ought undoubtedly to use for that purpose fruit from old rather than young trees, where possible, and to avoid, as far as can be reasonably done, the mixture of the produce of young and old trees.

The Soil.—An outline of the nature and course of the investigations now in progress upon soil influence on the quality of vintage fruit was given in last year's Report. Since its publication the work has been continued, and the examination of the chemical and physical characters of several of the selected soils has been practically completed. The vintage characters of the fruit grown on these soils have also been tested and compared, as far as is possible on a single season's results: but since the nature of the season has so considerable an effect on vintage quality, it is obviously impossible to arrive at definite conclusions until purely seasonal influences have been eliminated as completely as possible by several years' trials. Other factors such as the degree of ripeness of the fruit at the time of examination, the age of the tree, etc., must also be eliminated. Nevertheless, the results already to hand are suggestive in many ways, and may be expected to have a material influence upon the future course of the investigations. The connection between the chemical composition of the soil and the vintage quality of the fruit is not thus far apparent; but there is evidence that the physical characters of the soil exert a direct influence. All the soils already examined are of the heavy type, but the individual samples vary considerably as regards the proportions of relatively fine and coarse particles of which they are composed. No great differences in the rate of fermentation of the juices of the respective soils were observed, all being decidedly slow. This result, however, is not unexpected, since Kingston Black, the variety tested, almost invariably yields a slow-fermenting juice when grown on soils more or less heavy in character, particularly when the fruit is taken from comparatively old trees, as was the case in most of the present examples. Any difference in this direction produced by soil influences in the cases already dealt with could only be expected to be very slight. Differences in the flavour and character of the ciders were, however, observed; and these corresponded to a rather striking extent with those in the texture of the respective soils. The general tendency was for the soils containing the greater percentages of the finer particles to yield ciders of fuller flavour and body and of softer character than those in which the coarser particles were more numerous. That is to say, the more

the soils approached the stiff clay character the more full-bodied and softer were the ciders, while the reverse was the case with soils approximating to the sandy type. This apparent influence of the physical character of the soil may be due directly to the influence of the texture upon root development and action; but it may also be due to differences in the amount of moisture retained in the soil. Clay soils, being composed mainly of very fine particles, contain a greater amount of pore-space and, therefore, of space available for water storage than sandy soils, which consist mainly of larger particles. If there is anything in the latter possibility, the more moisture there is contained in the soil the more full-bodied should be the cider, so long as the amount of moisture does not surpass the point beyond which the healthy development of the tree is affected. The examination of the produce of the individual trees in the Young Orchard at the Institute, lends colour to this possibility. Most of the trees in this orchard produced sufficient fruit for examination and analysis this season. The comparative rates of fermentation of the juices from the individual trees were specially studied in order to see if there was any relation between them and the method of treatment of the individual trees. Taking the orchard as a whole, no relation could be determined, the results apparently being quite irregular. The only regularity in the results was observed in the case of the trees bordering on the end of the orchard adjoining the road. There are in all fourteen rows of trees in the orchard, running at right angles to the road. The varieties in each row differ; but starting at the road end there are in every case three or more consecutive trees of each variety. The level of the orchard at the road end lies from three to six feet above that of the road, which is separated from the orchard by a stone wall. In ten of the rows the trees fruited sufficiently to allow of examination. In every instance, the juices from the first, or first two, trees in the row, starting at the road end, fermented at an appreciably faster rate than their immediate successors in the same row. Since the strip of the orchard adjoining the road must almost certainly be better drained than the rest of the orchard, on account of its higher level above the road, and since in no other part of the orchard can any regular relation be traced between the rates of fermentation in adjacent trees of the same row and variety, the conclusion that the better drainage is responsible for the faster rate of fermentation in the end trees is strongly suggested. In other words, it appears that the amount of moisture retained in the soil, or the corresponding physical characters of the latter, may have much to do with the determination of the rate of fermentation. Since

ciders which ferment slowly tend to be more full-bodied and of superior quality to those which ferment quickly, it will be seen that the results of the investigations on the trees in the Young Orchard correspond with those arrived at in the soil investigations above described. They correspond also with the practical experience of cider-makers, since it is universally agreed that the cider made from fruit grown on heavy land is superior in quality to that from fruit off a light soil. It must, however, be left to the work in future seasons to decide whether this correlation in the results of this season's work is purely chance, or whether the nature of the moisture-retaining properties of the soil is, as is so strongly suggested at the outset of the investigations, really the important factor.

The thanks of the Institute are due to Professor S. H. Reynolds, and Messrs. C. T. Gimingham, C. J. Waterfall, and T. O'Brien, for their assistance in connection with this work.

The Nature of the Intermediate Stock.—This subject was dealt with in last season's Report; and the analyses of the juices of Dabinett apples grown on different intermediate stocks in the Young Orchard at the Institute were given for the season 1908. All the trees fruited in 1909, and the analyses for that year are given in the appended table, with those of the previous season for comparison :—

Comparing the figures given in the above table, it is evident that there is no very close agreement in the results, as a whole, for the two years, even allowing for the influence of the season. While Peasgood's Nonsuch and Newton Wonder (Tree 2) gave the lowest gravities in 1908, and very nearly the lowest in 1909, Annie Elizabeth (Tree 2), the next lowest in 1908, is one of the highest in 1909. Similarly, while Broadleaf Jersey and Newton Wonder (Tree 1) were respectively second and third in point of gravity in 1908, Warner's King (Tree 2), the first in 1908, is one of the lower half in 1909. Similar comparisons may also be made in respect of the malic acid and tannin contents. Certain of the trees, therefore, showed a tendency to produce relatively corresponding results in the two years; but others gave altogether different results. The comparatively close agreement of all the Morgan Sweet trees in all features except the rate of fermentation of the juice, both in 1908 and 1909, is interesting to note, and might be used to support the view that the intermediate stock has an influence upon the quality of the fruit: but the differences in the Newton Wonder results, and in other cases where there are duplicate trees, in that event require explanation. Thus, while there are some features which point to a definite influence of the intermediate stock, further

The Composition of Dabinett Juices from Different Intermediate Stocks.

Variety of Intermediate Stock.		Composition of Juice, 1908.			Composition of Juice, 1909.			
		Specific Gravity.	Malic Acid, per cent.	Tannin, per cent.	Specific Gravity.	Malic Acid, per cent.	Tannin, per cent.	Daily fall in Specific Gravity at 27 deg. C.
Annie Elizabeth	Tree 1 ..	—	—	—	1.056	.22	.136	9
Do.	Tree 2 ..	1.0565	.20	.268	1.057	.22	.212	12
Blenheim Orange	Tree 1 ..	1.057	.24	.374	1.055	.21	.240	10.2
Do.	Tree 2 ..	1.0625	.15	.364	1.057	.19	.204	—
Bramley's Seedling	Tree 1 ..	1.0665	.17	.382	1.049	.19	.256	9.2
Do.	Tree 2 ..	1.062	.26	.324	1.053	.22	.182	12
Broadleaf Jersey	.. ..	1.075	.12	.308	1.057	.20	.196	11.7
Broadleaf Norman	.. ..	1.062	.24	.364	1.052	.25	.176	10.2
Court Royal ..	.. ..	1.059	.18	.364	1.053	.24	.260	10.2
Ecklinville	Tree 1 ..	1.0645	.19	.332	1.052	.23	.164	12
Do.	Tree 2 ..	1.065	.17	.282	1.056	.23	.210	10.7
Hardwicke ..	.. ..	1.064	.24	.356	1.050	.20	.138	10.2
Hollow Core ..	.. ..	1.064	.23	.304	1.054	.23	.188	9.5
King of the Pippins	.. ..	1.064	.20	.290	1.055	.21	.176	13
Morgan Sweet	Tree 1 ..	1.064	.19	.414	1.056	.21	.212	6
Do.	Tree 2 ..	1.0655	.18	.374	1.057	.21	.180	7
Do.	Tree 3 ..	1.0625	.25	.348	1.058	.22	.156	7
Do.	Tree 4 ..	1.063	.19	.420	1.056	.20	.176	10.7
Do.	Tree 5 ..	1.060	.16	.334	1.055	.22	.180	11.2
Do.	Tree 6 ..	—	—	—	1.050	.22	.180	17.5
Newton Wonder ..	Tree 1 ..	1.073	.18	.384	1.057	.21	.212	9.7
Do.	Tree 2 ..	1.0535	.26	.274	1.050	.20	.196	8
Do.	Tree 3 ..	1.0665	.21	.344	1.050	.21	.144	8.7
Do.	Tree 4 ..	—	—	—	1.051	.21	.160	9.2
Peasgood's Nonsuch	.. ..	1.049	.21	.208	1.050	.24	.152	13
Sweet Alford ..	.. ..	1.065	.30	.346	1.054	.24	.096	12.5
Warner's King	Tree 1 ..	1.065	.18	.290	1.052	.22	.152	9.5
Do.	Tree 2 ..	1.0785	.22	.374	1.053	.22	.182	11.2

light upon the subject is required before any definite conclusions can be formed.

The Character of the Season.—The variations in the quality of vintage fruit from the same trees in different years, owing to purely seasonal influences, are familiar to every cider-maker. It is inevitable that the nature of the season should exert a very considerable influence upon the character of the cider on account of the important part played by sunshine and other weather conditions in connection with the ripening of the fruit. The subject was dealt with each year by Mr. F. J. Lloyd, in his series of Reports in this Journal on the experimental cider work carried on at Butleigh; and the influence of the characteristic features of each season was then discussed. Renewed attention to the matter has been called by the abnormal character of the 1909 weather. Although the seasonal influence is beyond the control of the cider-maker, it is possible that means might be found to minimise the effects of an unfavourable season; and even if none are discovered, any information likely to lead to the utilisation to advantage of the material at command, is of value. A study of the influence of weather conditions has been in progress at the Institute for some time; and, although only a few conclusions of a definite character have yet been established, reference is here made to the subject, partly on account of numerous enquiries which have been received, and partly in the hope that those interested in the subject may be led to place their own experience at the disposal of the Institute. Any information forthcoming will be welcomed.

There is little doubt that the richness in saccharine matter and the acidity of the fruit are closely connected with the amount of sunshine during the ripening period. The same factor is also of great influence in determining the rate of fermentation. How far the tannin and allied constituents are affected by sunshine has not yet been decided; but the results of the analyses of the 1909 crop show that the percentage of these substances has this season been abnormally low. The keeping qualities of the fruit have also been bad; and it is possible that the reduction of tannin so much below the normal may be largely, if not entirely, responsible for this effect. It is probable that sunshine has a particularly beneficial influence upon the quality of the fruit at certain critical periods during its ripening; but very little definite information on this point has yet been obtained. It is, however, certain that varieties which ripen at different periods do not receive the same amount of benefit from a spell of sunshine.

The amount of rainfall is also a factor of importance, its chief

influence probably being upon the saccharine constituents of the fruit. Generally a wet season is characterised by juices of low specific gravity. But although the juices appear to be weakened in strength, as it were, as regards sugar, and possibly also tannin, the dilution does not necessarily apply to the acidity. In fact, in wet seasons the tendency is for the acidity to be above the average; but this result is, perhaps, owing mainly to the deficiency of sunshine which usually accompanies a wet season.

The average temperature and the amount of wind are probably also factors of appreciable influence; but too little is at present known of their effect to allow of any generalisations being made.

To illustrate the degree to which the composition of the juice may be affected by seasonal influences alone, a number of analyses which show the variation in quality are given in the appended table, the fruit in the case of each variety quoted being taken from the same tree every year. The only other factor, therefore, which need be taken into account, in addition to that of the weather, is that of the degree of ripeness of the fruit at the time of its analysis; and that has been minimised as far as possible by dealing with fruit which may be described as thoroughly ripe. From this table it will be noticed that none of the features which show variation are affected equally or, necessarily, in quite the same direction by any one season; and even different trees of the same variety may exhibit somewhat different results in this respect.

Name of Variety.	Year.	Specific Gravity.	Malic Acid, per cent.	Tannin, per cent.
Kingston Black	1904	1.0535	.47	.178
	1906	1.064	.70	.164
	1908	1.062	.76	.272
	1909	1.048	.60	.148
Chisel Jersey, Tree 2	1907	1.070	.24	.412
	1908	1.066	.18	.454
	1909	1.053	.37	.190
Chisel Jersey, Tree 3	1907	1.066	.23	.544
	1908	1.070	.27	.540
	1909	1.052	.24	.126
Skyrme's Kernel, Tree 1	1907	1.058	.71	.270
	1908	1.060	.57	.228
	1909	1.055	.49	.170
Skyrme's Kernel, Tree 2	1907	1.058	.74	.250
	1908	1.059	.54	.198
	1909	1.051	.54	.192
Butleigh No. XIV.	1904	1.089	.19	.306
	1906	1.0918	.20	.432
	1907	1.086	.16	.324
	1908	1.098	.10	.420
	1909	1.058	.34	.108

Investigations on Fruit Culture.

Experiments on the Pruning of Apple and Pear Bushes.

In last season's Report, an account of the scheme of pruning experiments on apple and pear bush trees worked on the Paradise and Quince stocks respectively, was given. Since the plantation was only laid out in 1905, it is at present too soon to attempt to draw definite conclusions from the results of the experiments; but the 1908 crops, so far as they went, indicated very clearly the advantage of light over hard winter-pruning for obtaining quick cropping, while as regards growth the lightly pruned trees, in the case of practically every variety under trial, had developed sufficiently stoutly and produced enough new wood for future requirements. The bushes which were root-pruned in 1907, two years after planting, gave in 1908 for most varieties appreciably larger crops than the non-root-pruned trees, but all suffered in growth from the root-pruning, and some varieties, particularly Lord Suffield, were very seriously weakened.

In 1909 nearly all the bushes produced fruit, and the crops in many instances were quite good. The table, on next page, gives the average weights of the crops per bush for each variety under treatment, according to the system of pruning adopted.

It will be observed from these figures that the superiority of light over severe winter-pruning for cropping purposes, which was observed in the 1908 crop, is very markedly shown also in that of 1909; and, as far as can be seen, the gain in crop has not been obtained at the expense of the future productiveness of the tree. In the case of many varieties the bushes in the lightly pruned sections have already practically filled their allotted space, so that little further increase in size is necessary. The manner in which such bushes are furnished with fruit spurs furnishes a striking contrast between them and those which have been severely pruned. Consequently there can be little doubt in the minds of those who have seen the individual trees that, for soils of the character of that at the Institute, and in plantations of mixed bush and standard trees, or of bush trees only at comparatively small distances apart, light winter pruning is likely to prove much more profitable than severe pruning.

The results for the two columns representing bushes pruned at discretion—except for the distinction of root-pruning—represent in the main the effects ofmoderate winter-pruning; but it is not fair to the system of pruning adopted for each variety—which varies, of course, according to the general character of growth and cropping

Crop Record for 1909 of Apple and Pear Bushes under Different Systems of Pruning.

Average Yield in lbs. per Bush.

Name of Variety.	Not shortened, thinned only. No summer or root pruning.	Slightly Shortened.				Severely Shortened.				At discretion.	
		No summer or root pruning.	Summer pruned.	Root pruned.	Summer pruned, and root pruned.	No summer or root pruning.	Summer pruned.	Root pruned.	Summer pruned and root pruned.	Not root pruned.	Root pruned
APPLES—(Dessert)											
Allington Pippin ..	20	25	24	21¾	20	¾	10	5½	6	14¾	17
Beauty of Bath ..	1¼	2½	1¼	3¼	1¼	1¾	1¼	¼	¾	1¾	1½
Cox's Orange Pippin ..	4½	4¾	16¾	10½	5	2¼	1½	5¼	2¾	3½	8¾
Devonshire Quarrenden	5¾	8¼	8	2¼	¾	—	¼	1½	2	1¾	1½
King of the Pippins ..	21	13¾	3	15¼	4	1½	2¼	2½	1¾	4	6¼
Worcester Pearmain ..	—	5¼	2	7¼	2¾	2¼	1¾	1	3½	3¼	4¾
(Culinary)											
Bramley's Seedling ..	5¼	5	—	9¼	4¼	¼	¼	9	1½	1	2½
Ecklinville Seedling ..	6¼	16¼	17	11¾	4½	7¼	13½	8¼	10½	15¼	6½
Lane's Prince Albert	10½	30	13½	15¼	4¾	17¼	9¾	15½	2	5¾	4½
Lord Suffield	2¼	3½	2½	6¾	3¼	2	4	—	3¾	2½	¼
Newton Wonder ..	14	12¾	14	19¾	19¾	4½	¾	24¼	7½	5¾	8¾
Stirling Castle ..	22¼	19	20½	¼	2¾	3½	3¼	5	3½	12¾	4
PEARS—											
Catillac	4	—	¼	—	—	—	—	—	—	—	—
Doyenne Boussoch ..	19	4½	8½	3	4¼	¼	1	—	1¾	5¼	—
Louise Bonne de Jersey	19½	15½	22	11½	18	8½	10	9	6¼	7¾	9¾
Williams' Bon Chretien	—	8¾	2½	—	4½	¼	1	3¾	3	3½	1½
Total	156	177¾	155½	137½	99¾	52¼	60½	90¾	56½	88½	77½

qualities of the individual varieties dealt with—to lay much stress on the results thus far shown, since the special form of pruning selected has only recently been put in operation, the trees previously having been included either in the lightly or severely pruned section. It appears, however, that moderate pruning in this series of experiments will yield results intermediate in character between those for light and severe pruning.

In contradistinction to the results for light and severe pruning in 1908, it will be observed that the effects of root-pruning as illustrated by the 1909 crop are, as a whole, exactly opposite in character from those shown by the 1908 crop. In the latter instance the crops from the root-pruned bushes were decidedly heavier than those from the non-root-pruned bushes; whereas, in the former instance, the results are reversed. It appears, therefore, that the beneficial effect of root-pruning in encouraging cropping has been temporary only: and the reason is obvious, when the root-pruned and non-root-pruned trees are compared. For most varieties, as stated last year, the production of the crop was at the expense of the current season's growth, and during the past season this check to growth has still been felt. While, therefore, the branches of the root-pruned bushes in many instances are rather better furnished with fruit spurs than equal lengths of those of non-root-pruned bushes, the actual size of the trees is so much smaller that the total number of fruit spurs per tree is also decidedly fewer. While this statement holds good for most varieties, there are some, such as Bramley's Seedling and Newton Wonder, which still show the benefit of root-pruning; and the variation in the results with different varieties thus far accords perfectly with the experience of fruit growers generally. The results in respect of root-pruning for the first two seasons after the operation may be summarised as follows: root-pruning produced an increase in crop in the season following the operation; the beneficial effect passed off entirely, or almost disappeared, in the following season in the case of the weaker growing varieties owing to the severe check to growth, and probably will eventually prove to the detriment of the trees; but it was still appreciable in the case of the stronger growing varieties, and may possibly still be felt for several seasons.

It is too early yet to generalise as to the respective merits of the various combinations of pruning which have been tested; but, certainly thus far, the results point to the conclusion that, except for very strong growing varieties, where root-pruning is probably desirable to force a crop, and for very weak growing varieties, where severe winter pruning may be required in the early stages to

encourage good wood formation, the less the trees are pruned the better, when both growth and cropping qualities are considered. If this proves to be the case, it will confirm the results of pruning experiments carried on under quite different conditions at the Woburn Experimental Fruit Station.

Strawberry Runner Experiments.

The third season's crop in this series of experiment has now been obtained, and the trial may therefore be considered completed. The point under investigation in these experiments has been to determine the relative cropping qualities of "first" and "second" runners, and the details of the scheme may be found on reference to last year's Report. From results published therein, it was found that the total crops of 1907 and 1908 from the five varieties under trial were 712¾lbs. for the "first" runners, and 607¼lbs. for the "second" runners. The following table gives the complete statistics to the end of the trial :—

Crops from "First" and "Second" Runners for 1907, 1908, and 1909.

Name of Variety.	Yield in lbs. from "First" Runners.	Yield in lbs. from "Second" Runners.
Royal Sovereign 1907 ..	13½	7
Do. 1908 ..	177¼	135¼
Do. .. 1909 ..	193¼	157
Sir Joseph Paxton 1907 ..	24	17¼
Do. 1908 ..	223½	240¾
Do. 1909 ..	165½	154
Monarch 1907 ..	5½	3
Do. 1908 ..	138¼	121¾
Do. 1909 ..	139½	130¾
President 1907 ..	6½	4
Do. 1908 ..	80¼	51
Do. 1909 ..	213	98
Latest of All 1907 ..	½	½
Do. 1908 ..	44	26¾
Do. .. 1909 ..	93½	60
Total yield for 1907, 1908 & 1909	1517½	1207

The larger yield from the "firsts," already obtained in 1907 and 1908, has been therefore continued in 1909 ; and the difference in the third year's results has been more pronounced than in either

of the two previous years. Taking the varieties separately, President gave the greatest difference; while Royal Sovereign and Latest of All gave results definitely in favour of the "first" runners. There was a slight balance in favour of the "first" in the case of Monarch: but Paxton's gave practically the same yield for both sets. There is therefore good evidence that "first" runners tend to be more fruitful than "second"; and there is a sufficient margin of difference in the yields to make it a matter of practical importance to the grower to select only "first" runners for planting.

Pruning Experiments in Gooseberries.

A series of experiments on the pruning of gooseberry bushes was started during the early spring of 1908 on bushes planted in Plantation No. I., in 1905. Previous to the beginning of this trial, all the bushes were pruned on the "hard" system described below. Four varieties are under trial, these being Whinham's Industry, Keepsake, Crown Bob, and Lancashire Lad. There are four rows of each, two of which are still being pruned on the "hard," and the remaining two on the "light" system. What is here termed the "hard" system is that commonly adopted in districts outside the larger fruit-growing areas. It consists in clipping back fairly hard all the leading shoots of the bush and trimming the laterals still harder, so that its surface is more or less regularly spherical, like a well-trimmed and closely clipped bush. Superfluous growth in the centre of the bush is also reduced. It is made up therefore of a comparatively dense and restricted branching system. The "light" system is found more commonly in the large gooseberry-growing districts, and differs considerably in character from the preceding. The leading shoots are not cut back so closely, while the laterals are more reduced than in the "hard" system, the object being to allow ample room for the insertion of the hand when picking the fruit. All superfluous wood in the centre of the bush is also cleared. A lightly-pruned bush, therefore, differs very considerably in appearance from a hard-pruned one, being comparatively loose, straggling, and open, instead of close-cut, regular, and dense, as in the latter case. Ease and economy of time in gathering the fruit, and an improved quality of berry, both as regards size and colour, owing to the open character of the bush, are the main advantages claimed for the "light" system. The question of the yield of the crop has been in dispute; and the experiments now being carried on are mainly directed to the settlement of that

point. The appended table gives the yield of each variety under the two systems for the seasons 1908 and 1909.

Crops for 1908 and 1909 in Gooseberry Pruning Trials.

Name of Variety.	Yield in lbs. from "light" pruned bushes.	Yield in lbs. from "hard" pruned bushes.
Crown Bob 1908	28½	21¾
Do. 1909 Picked green	116½	100¼
Do. 1909 Picked ripe ..	178¼	116
Keepsake 1908	72	105¼
Do. 1909 Picked green	179	103½
Do. 1909 Picked ripe ..	202¾	249½
Lancashire Lad 1908	90½	101½
Do. 1909 Picked green	57¼	76¼
Do. 1909 Picked ripe ..	102¾	105¼
Whinham's Industry 1908 ..	97	85½
Do. 1909 Picked green	176	134
Do. 1909 Picked ripe ..	230½	205
Total yield for 1908 and 1909 ..	1531	1403¾

The records, therefore, for the first two seasons of the trials show that in the total for all varieties there is a slight, but definite, gain on the side of the "light" system. For Crown Bob and Whinham's Industry the gain is comparatively large; the Keepsake returns are practically the same for both systems; and the Lancashire Lad crops give a small gain to the "hard" system. While the question cannot be considered settled by two seasons' results, it is evident that thus far any numerical superiority in the berries on the "hard" pruned bushes has been generally more than counterbalanced by the larger size and weight of the individual berries on the "light" pruned bushes. The latter also exhibit superiority in quality, and consequently tend to command a better price. The economy of time and labour in gathering the fruit is so markedly in favour of the latter system that, if the crop returns continue as they have begun, there will be no doubt which is the more profitable system for the grower.

New Experimental Vintage Orchards.

Last season the Board of Agriculture, the Bath and West Society, and the County Councils of Devon, Somerset, Gloucester, Hereford, Worcester and Monmouth, each received grants of 300 vintage

trees raised in the Nursery at the Institute for the purpose of establishing experimental vintage orchards at various centres. Thirty-two orchards in all were planted during the planting season of 1908-9; and reports from the respective centres show that practically all the trees sent out have become satisfactorily established, and, considering the nature of the past season, have made substantial progress. In addition to these, over 1,000 other trees from the Nursery were supplied to Members and Associates of the Institute, so that it is an encouraging sign for the future to find that the question of the provision of fresh vintage orchards of standard varieties is receiving serious attention. During the present planting season, another lot of trees is being distributed, 150 being given to each of the above-mentioned bodies; while a considerable number are being again taken by Members and Associates. At the same time fresh stocks are being planted in the Nurseries to take the places of those already sent out; and these are being worked with the varieties which have given the best results in the experimental work in the cider-house, so that a regular supply of trees may be forthcoming for future planting. It is desired to make it perfectly clear that, in propagating vintage trees for distribution, the Institute has no intention of entering into competition with the limited number of nurserymen who already propagate vintage varieties for sale. It is of the highest importance to the future of the industry that growers should have no difficulty in obtaining a sufficient supply of young trees for planting. At the present time, many of the varieties which have done best in the experimental trials are not propagated by any nurserymen; and of the recognised standard sorts which are propagated it is frequently impossible for growers to obtain the requisite number. It is the purpose, therefore, of the Institute to supplement the work of the nurserymen by propagating the best varieties not already obtainable in commerce; and if anyone in the trade wishes to introduce any such stocks, the Institute will be glad to furnish him with the necessary supply of buds and grafts, true to name, so far as they are available, and to assist in procuring fresh supplies, where necessary.

There has recently been some discussion as to the best age and size of standard trees for planting. In certain districts there is a strong prejudice in favour of planting large trees 7 or 8 years old at least. While there are certain advantages in this system, it is undoubtedly decidedly inferior to the practice of planting trees not older than 4 or 5 years. Experiments at the Institute and elsewhere have proved that the latter system is far more economical and produces much more satisfactory results in the long run than

the former. The check to growth in lifting and planting a young tree is much less severe than in the case of an older tree; and the comparative rate of growth afterwards is so greatly in favour of the young tree that it equals or outstrips in size an older one planted at the same time in very few years. Detailed results of the experiments will be given in the Annual Report of the Institute.

XVIII.—REPORT OF THE SOCIETY'S CONSULTING CHEMIST.

(*Dr. J. A. Voelcker, M.A., F.I.C., &c.*)

It is somewhat remarkable that, after the interest aroused by the issue of the last Annual Report to the Council, containing, as it did, accounts of several cases of gross adulteration which had been detected through the Society's agency, this should not have been followed up by further activity in 1909. Such is, however, the case, for, whereas in 1908 the number of samples sent by members for analysis was 14, it has unaccountably fallen in 1909 to three only. These three samples consisted of two of water and one of soil, and none of them call for special comment. In addition, there were two letters of consultation, and, for the Society's Exeter Show, 50 samples of milk were analysed in connection with the Milk Prizes then awarded.

XIX.—REPORT OF THE SOCIETY'S CONSULTING BOTANIST.

(*W. Carruthers, F.R.S.*)

Eight inquiries were dealt with during the past year from gentlemen who stated they were members of the Society. Two members had offered to them seeds of hard fescue when they had asked for red fescue. A sample of smooth-stalked meadow grass, purchased with a guaranteed germination of 90 per cent., grew, after a prolonged test, only 4 per cent. An injury to the leaves of holly was due to the grub of an insect which finds its food in the tissues of the leaf. The other inquiries presented nothing deserving of special note.

The Note-Book.

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Points in Herd Management.—Whatever fault may at times be found with our methods of farming, in one aspect of rural development the British farmer is supreme. I refer to the manner in which he manages the herd. It is a difficult matter to explain why in an island of so few acres, but of such great potentialities, the finest herd masters in the universe should be found. I believe that in no other country can such remarkable diversity of bovine racial character be found and at the same time such simple yet masterly handling of breeds. Take the south-west of England as an example. The two Devonshire breeds are quite distinct in character. They have, strictly speaking, nothing in common except that they will eat and produce milk and beef. The methods of management differ entirely. They are attuned respectively to the aims of breeders, who, in the case of the Devon, or Ruby, seek to develop the highest quality of beef on a comparatively small carcase, whereas the South Devon is bred with the idea of making a big family joint or satisfying a club or restaurant trade, while at the same time producing a heavy yield of milk. The difference in the object of the breeder creates that variety in the management of the herd which makes the rearing of cattle so interesting a study.

There are one or two points which deserve attention. The summer management of all herds is practically the same. Plenty of grass and as much of the open air as possible are the two indispensable conditions if the herd is to enter the winter in a fit condition to withstand the varying temperatures. The problems which most frequently vex the breeder are not connected with the supply of food. According to the extent of the farm and the nature of the land that is provided for. But questions arise which the breeder had best settle for himself according to the aims he entertains in breeding.

I propose to refer to a few different matters, each of which closely affects the well-being of the herd. The first of these is : At what time is it most profitable to breed from a heifer ? The answer to that question would appear to be when she has so grown that carrying a calf will not interfere with her stature and scale, but experience has suggested that in certain breeds it is advisable to induce a heifer

to mature a bag as early as possible, so that as a four-year-old cow she may show a full udder. Mating before they are two years old has, therefore, been found to answer very well. In a Jersey herd, for instance, where size and substance are not material—indeed, rather sacrificed to quality—early mating is a distinct advantage. It, so to speak, saves a year in the young cow's life by getting her in profit if not a year earlier, at least with a bigger bag and better yield than she would otherwise have.

This practice, however, is not peculiar to breeds like the Jersey. To my knowledge it is adopted in several leading herds of other breeds. One Hereford breeder, who has achieved much success with his white-faces, makes a regular practice of it. Although we usually associate beef making with the Hereford breed, it is capable of producing a fair yield of milk, and that very rich if the right strains are sought. This breeder holds that a heifer calved early in the year—say, January—should have her first calf twenty-six months later, *i.e.*, in March. It very frequently happens with heifers on the appearance of the first calf that they do not keep their milk till the grass comes if they calve, say, in December or January. This is obviated by taking the calf at rather a later date. The youngster would be suckled comfortably till May, when it would require less, or could be put on the bucket at pasture if desired. Obviously it is a tax upon a young heifer to carry a calf, and that her development should not be unduly hindered, the policy carried out in the herd above referred to is to skip a year, and aim at having the second calf in the fourth year. It is undoubtedly prejudicial to the milking qualities of a breed to start the first calf when the dam is three years old. Not in one, but in other herds, notably a Red Polled, is early fructivity favoured, with a rest between the first and second calves. The plan is worthy of a trial in those herds which have traditionally followed the older practice. Certainly in none of the herds in which the system has been carried out has the stature of the animals suffered; indeed, they are, in both cases above referred to, well-known for the size and early maturity of the animals.

The second problem to which I propose to refer affects the time of calving. Probably in no matter of policy are breeders more sharply divided than in this. We may take it that the general policy is to calve early in the year, so that the calf may be reared under the most favourable auspices. The first month or two it is being grown on mother's milk, and does very well, whether in or out of doors. It is then in fair condition for going on to pasture, where it can find a good living for itself when the dam gets on in lactation, or the system pursued is to give a little skim or separated

milk and linseed or other artificial food. That plan suits the ordinary breeding herd as well as any other, and its common sense is commendable. It must, however, be modified to suit circumstances. I do not refer, of course, to the early calving dates sanctioned by herd books. These are arranged with an express object, and affect beef breeds which may calve to suit the Smithfield Show.

Take the case of the breeder who exhibits. He has a good two-year-old heifer he wishes to show. It is a well-known fact that in young stock particularly it is an advantage to have them in calf. They breed much more satisfactorily and are less fidgety; indeed, it is not an uncommon practice when preparing heifers for the fat-stock shows to give them the attentions of the bull. They settle down much better afterwards. On the other hand, it is often those heifers which are not likely to breed that are prepared for the great fat-stock shows. That, however, is by the way. When exhibiting a two-year-old at the summer shows it is not advisable to have her visibly, at all events, not heavy in calf. Therefore the plan is followed out of varying the date of service for a first calf in the case of show heifers. Assuming that the Royal Show is the incentive, a December or January service is provided in many herds, and although the first calf may fall a little late in the year, the object gained is considered to justify the early service.

In the ordinary non-pedigree herd, which exists to supply milk for town consumption, the calving dates are expressly arranged to keep the balance of the milk supply. Many shrewd men are of opinion that it pays to have the larger percentage of calves dropped in the late autumn, so that the winter contract can be carried through with a full supply of milk at the higher price. In this case the calves are separately reared, or specially run with nurse cows, or immediately they are dropped sold to the calf merchant, who will run them for veal.

It is well known that nothing is better calculated to decrease a cow's milking capacity than to let her suckle the calf. The irregular meals which the calf takes do not encourage lacteal secretion. The difficulty is surmounted in some herds where milk records are kept, by the purchase of nurse cows, themselves in calf. The profit from her calf partially pays the price of the cow, and when she is sold out dry and again in calf the breeder finds that he has practically reared two pedigree calves at little or no expense. The nurse cow has thus her use, in order that the milk records may be maintained and promising young calves reared in the most natural and progressive way.

One phase of this question should engage more serious attention.

Our system of showyard milking trials has favoured a system which cannot be considered as likely to lead to the placing of the chief awards where they are in reality most deserved. I refer to the period during which cows are kept dry specially to win prizes. It can scarcely be regarded as the true test of a cow's milking capacity if she has run from three to four months dry as a special preparation for the August or October milking trials. It behoves societies to consider this matter, which affects the utility of these tests just as much as the period of lactation, for which points are now given.

The only other matter to which I should like to refer is one which has long agitated the breeder. Is it possible to rear a herd of dual-purpose cattle, *i.e.*, devoted both to milk and beef? The answer to this question may be either yea or nay. We have individual representatives of herds which are clearly enough entitled to be considered fit for two purposes. Thus a Red Poll gives a good yield of milk, and is capable of carrying a good depth of flesh; indeed, I have in my mind's eye a cow of this breed which produced two breed champions at Smithfield, and herself gave over 1,000 gallons of milk yearly for six consecutive years. That, however, only emphasises the individuality of the performance. Take the Shorthorn and Red Poll herds throughout. Milk and beef are clearly separate. In East Anglia the milking herds are lean-fleshed cattle, although occasionally an individual cow may challenge that assertion. It is precisely the same in Shorthorns. The milking herds that specialise to make a living by the quantity of milk produced are far short of the beef-making capacity of bull-breeding herds of the Scotch type. Therefore, individual cows prove the possibility of specialising in both milk and beef, but an examination of the herds in the aggregate clearly convinces me that it is visionary to expect the dual-purpose type to be continuously bred. It is better to have two types and stand by one of them. The most that we can expect of the average deep-milking cow belonging to a breed noted for flesh and also for milk is that she will keep the aptitude to fatten readily when dry, and that, after all, is the great thing.—"Cor." in *The Field.*

Signs of Change in Farming.—For the first time for 25 years English wheat in October last sold for more than 40s. a qr.; to be accurate, old English wheat sold at 43s., while the season's crop was quoted at 38s. With wheat at 40s. a qr. many men are beginning to look at their pastures and wonder if the time has not come to set the plough through them once more. Year by year since 1875 the plough land has been diminishing—in Great Britain

it has shrunk from over 18 to under 15 million acres, while the grass land has increased from 13 to $17\frac{1}{2}$ million acres ; but for the last year or two the change has been slowing down, and now we may expect to see the tide begin to flow in the other direction. Of course the price of cereals has been the great cause of the conversion of arable into grass ; wheat touched its lowest depth in 1894, when the official average price was only 22s. Since that time the price has been rising, with occasional spurts due to speculation at times when the farmer had no corn to sell, spurts followed by as many fallings back, but still always making an upward trending curve when the temporary fluctuations had been smoothed out.

Since the great depression the cost of growing wheat has been diminished, bad times have taught farmers how to reduce their expenses, better tools are available, and the self-binder alone has revolutionised the cost of harvesting. So great have been these savings that for the last ten years corn-growing has been paying the lighter land farmers of East Anglia and the Midlands very handsomely, how handsomely the lack of system in farm book-keeping has perhaps not permitted them to know. If wheat is going to stay at or near the 40s. level and other cereals rise, as they must, to an approximate parity, much of the land in the country that is now laid down to indifferent grass ought to go under the plough, though it may cost more to work than the favoured lands of Norfolk and Suffolk. Nor, indeed, need there be much fear of corn prices' falling away for some time to come ; the United States are rapidly ceasing to be exporters of grain, because the first rich skimming of the virgin soils in the Middle and North-West is over and the population is growing up to the production ; in a very few years the United States will be buying wheat from Canada, first of all to maintain its export trade in flour, and then to feed its own people. The Argentine is displacing wheat with cattle ; wheat is the crop whereby new land can be reclaimed and made to pay for the first outlay, but subsequently the land pays best when laid down to alfalfa and when cattle are brought in.

Again, both Japan and India are becoming consumers of wheat as they never were before ; the demand is increasing everywhere, while those great expansions of the wheat-growing area which marked the last 40 years seem to have come to an end. We can estimate the capacity of Canada ; great as it is, it will probably no more than repair the decline in the rest of America ; the only unknown factor is the possibility that Siberia may become one of the great granaries of the world. But there seem many reasons why Siberia will not be opened up in the rapid fashion that has

characterised the western prairies and Argentina, so that we may reasonably count on corn prices being steady or rising for some time to come. Even if the price remains at 40s. then a four-quarter crop will produce £8 per acre, the figure which used to be taken as the cost of production of an acre of wheat, but which is much too high nowadays. And four quarters per acre is only the average yield of the country, well below the crop which every good farmer expects, and indeed secures, taking one season with another.

If, however, wheat and, to a less extent, barley and oats, pay under existing conditions, we must still remember that there are other crops in the rotation, roots and seeds, which have to be converted into beef or mutton before they can be realized, and it is precisely live stock which at the present time forms the most delicate part of the farmer's business. For some years, indeed, the men who farmed their arable land by the aid of sheep, to consume the turnips and the green crops on the land, have found their sheep-farming as profitable as their corn-growing. But the last 18 months have given such fatteners of store sheep a bad turn; many men last winter sold sheep fat off the turnips for less money than they had given for the lambs. Within 12 months, sheep values fell about 20 shillings a head, and there seems as yet little sign of improvement. Men are afraid to buy sheep, and by a sort of curious perversity the public seem to buy less mutton as soon as it is cheap. However, now that all these losses are over and the breeders have written down the value of their ewes, the trade must resume an even course again, not so profitable, indeed, as it was a year or two back, when the stock of sheep was short all the world over, but still one leaving a margin between fat stock and lambs. Then the farmer of arable land light enough to stand the folding of sheep will again be in a very strong position; for not only is folding the cheapest way of handling the root crop, but it ensures the loss of fertilizing materials being reduced to a *minimum*.

If folding sheep has for the moment ceased to be a profitable means of utilizing the root and seed crops, yet feeding bullocks is a still less paying branch of farming. Those men who watch their expenditure will admit that the bullocks only return the cost of their cake provided they are given their roots and hay for nothing, and if the account keeping of a farm were only systematized so that a profit and loss could be struck for each branch of the work, this feeding in stalls would be found to be a loss of money every year even after a liberal allowance had been made for the dung produced. The causes are not far to seek; store stock have been too dear for years, feeding stuffs have been steadily rising in price, and the fat

stock markets all over the country have been very unstable under the highly organized competition of the great dead-meat importers. The effectiveness of this competition is not merely due to the cheapness of the foreign article, but very largely to its convenience; the local butcher can order foreign meat of any desired quality by telephone, in perfect security that he will get what he demanded in a properly hung condition; he has not to trust his judgment in buying stock in the open market or his skill in killing and storing, operations for which he has, indeed, often but indifferent facilities. Unless English farmers and landowners can form combinations to sell their live stock as dead meat properly graded out of cold store, they must eventually lose the bulk of the trade. It is only the lack of proper bookkeeping which has prevented arable farmers from realising what a losing game beef production has been for some time, and what a source of weakness is the cake bill of the farm. Nor is there much prospect of improvement; store stock are likely to become scarcer with the present trend of affairs in Ireland, while as dairying extends in Britain, the class of calves produced for the feeder becomes poorer, because very few dairymen seem to care what kind of bull they use and are neglectful of the extra price they can make for a properly-bred calf such as will pay a grazier to fatten. Cakes and other feeding stuffs, too, must rise in price in sympathy with wheat; already the United States are importing maize for manufacturing purposes instead of exporting it to Europe.

As a means of utilizing the green crops in the rotation, dairying on the green-soiling system has been tried, the roots and other crops being carried in to the cows, which remain in their stalls throughout the year. This process has, however, proved expensive in labour, and milk produced in this way competes with difficulty with the milk off the grass land. But, if both dairying and fattening must be dropped, can we dispense with the root crops altogether and grow nothing but corn? This is a revolutionary proposal, but Mr. Prout has been doing it with success at Sawbridgeworth ever since 1881, and it is one of the most curious facts in English farming that he should have found no imitators. The conservatism of landlords and lawyers, "the usual covenants," stand in the way; but still one would have hardly expected the farming community to be so unimaginative or so unbelieving as never to have followed Mr. Prout's lead. Of course, he has had an advantage in being within reach of London and of a good market for straw. But straw is now falling in price because of the displacement of horses by motor-cars. However, it will always be worth something, even if only for paper making, and a yield of five quarters of wheat per acre at 40s.

per quarter secures profit enough in itself. Even if continuous corn cropping be not adopted in its entirety, it is still possible to increase very largely the proportion of corn crops in the rotation.

If arable land can be made to pay again, will it be more profitable than the grass land which has so largely taken its place during the past 30 years ? It is fair to say that poor grass land never has paid except under a most poverty-stricken kind of farming, where every little that is taken off the land is so much clear profit. On good natural grass, or on good land laid down to grass, dairying has always been profitable ; so also has beef production on the natural bullock-fattening pastures and on the rich marshes. But where stock have to be fattened on any but the best grass land the growing cake bill has been eating up all the profit. Probably in such cases it would now pay better to take to breeding and sell stores ; certainly on the medium land the grazier, even if he does sell fat stock, ought to have bred them first. There is then a safe margin for profit without the speculation that is introduced by dealing and buying stores. Moreover, it is probably wisdom to keep the cake bill low, but to spend money on manures that will improve the quality of the pastures and enable them to carry more stock, making the grass do the work, and not the purchased foods.

Good natural grass land will continue to pay when grazed, but the poorer pastures, especially on the lighter soils, will certainly yield more profit to the farmer and more food for the community if put once more under the plough and cultivated on modern lines. Of course the " safety " of grass land has become a watchword with landlords and agents since the great fall in prices ; they fear to risk the capital value of a pasture once laid down, even though it is obviously of little value or deteriorating ; they forget also that it no longer " breaks " a man to make a pasture, should a return to grass again become necessary. Of course it is not contended that all the four million acres which the grass area has gained in the last 30 years ought forthwith to be ploughed up, but it should be realized that wheat at 40s. means an entire change in the agricultural situation, and that to devise a policy to suit it calls for clear thinking and open-mindedness on the part of both landlord and tenant.—*The Times.*

Milk and Dairies Bill (1909).—The Milk and Dairies Bill (1909), introduced in the House of Commons by the President of the Local Government Board in May, made no further progress, and was a victim of what is popularly known as the " Massacre of the Innocents " in August last.

The fate of the Bill has not evoked many expressions of regret, and both consumers and producers of milk appear to have accepted its withdrawal not only with resignation, but with equanimity.

The general public has never taken any great interest in the milk supply question, notwithstanding attempts in the press to excite a sensation by describing the results of microscopic examination of some particularly bad samples, but experience has led consumers to the conclusion that such cases are fortunately exceptional, and that milk, as ordinarily supplied to them, is not so contaminated or dangerous to health as some scientific experts would have them believe.

It will, however, be generally admitted that milk, as it reaches the consumer, even when produced under thoroughly favourable conditions, is not always as pure and clean as it should be ; indeed, to anyone who has observed the manner in which it is distributed in some of our large towns it would be a miracle if it were so ; while the conditions under which it is sometimes produced and conveyed from the country to the towns leave much to be desired.

Any measure which would effect improvement in these respects would have the hearty support of all engaged in the milk trade.

In the first place, legislation which would give the public greater confidence in the purity and wholesomeness of milk would tend to an increased demand, with consequent benefit to the producer of the article ; and, secondly, the existing conditions of affairs is so chaotic and unsatisfactory that general and compulsory legislation for the whole country would be welcomed by all concerned.

I propose to consider shortly the objects which the Bill desires to attain, how far the provisions in it are likely to prove successful, and the objections which practical persons engaged in the dairying industry have taken to certain of its proposals, in the hope that before legislation is again introduced some consideration may be given to criticisms which have been made, not in any spirit of hostility, but with an honest desire to make its provisions work smoothly and successfully.

I would wish in the first place to admit that the Bill is a conscientious attempt on the part of the President of the Local Government Board to deal with a difficult and complicated problem, and to give greater protection to the public without placing unnecessarily harassing restrictions on the industry concerned.

Its objects, excellent as they are, can only be attained through the assistance, co-operation and goodwill of all parties concerned, and I fear that some of the provisions as they stand will not tend to harmonious working, but would appear to have been framed

without consideration for the conditions existing in country districts, and the feelings and views of those who reside in them.

The objects of the Bill are so briefly and clearly set out in the memorandum attached to the Bill that it may be advisable to state them here :—

(1) The more effective registration of dairies and dairymen ;
(2) The inspection of dairies, and the examination of cows therein ;
(3) The prohibition of the supply of milk from a dairy where such a supply has caused, or would be likely to cause, infectious diseases, including tuberculosis ;
(4) The prevention of the sale of tuberculous milk ;
(5) The regulation of the importation of milk, so as to prevent danger to public health arising therefrom ;
(6) The issue of regulations for securing the supply of pure and wholesome milk ;
(7) The establishment by local authorities in populous places of milk depots for the sale of milk specially prepared for infants.

Proposal (4) will, of course, command general approval, if the means by which it is sought to be attained can be relied on as efficient ; as will proposal (5) without which, as a corollary to any measure dealing with the home-produced article, the dairying interests would never be satisfied.

It is not, however, sufficient that raw milk introduced from abroad should be subject to inspection ; but a most scrupulous and careful examination should be made of all milk products imported into this country from places where it is impossible to control the conditions under which the milk, from which they are made, has been produced.

If the ratepayers do not object to the provision (7) of a free (or nearly free) supply of milk for infants at their expense, there seems no reason why others should do so, but that it is a form of municipal trading capable of indefinite expansion at the expense of the private trader and the ratepayer alike, can hardly be denied.

It will be observed that the object in the first three paragraphs of the memorandum is to prevent the supply of milk from insanitary premises, or from unhealthy animals, or produced under improper conditions. These provisions, if judiciously and effectively carried out, will go some way to improve existing conditions, and no one will doubt that they are desirable. It is only with regard to the procedure by which they are to be enforced that differences of opinion arise, and with these I propose to deal later on.

But the most important object of all is to secure to the public a supply of pure and wholesome milk, and this is left to be dealt with by Orders to be made by the Local Government Board in

consultation with the Board of Agriculture, under Section 6 of the Bill.

It may be argued that it is desirable for this purpose to confer on public departments large powers of making regulations which could be varied and adapted to different circumstances in different localities, rather than by hard and fast rules in an Act of Parliament. However desirable elasticity may be in this respect, experience leads us to look with considerable apprehension on legislation by departmental Orders.

It is surely reasonable to ask that Orders, which must seriously, and may injuriously, affect a great national industry, should not be imposed at the discretion of a Governmental department, or of even two departments in consultation, but that Parliament should have the opportunity of considering, and, if necessary, revising such Orders before they are allowed to come into force.

The Bill provides that the Local Government Board, in consultation with the Board of Agriculture, shall decide as to the authorities by whom these Orders are to be executed, but the provisions in the Bill are to be enforced by local sanitary authorities, while powers are given to County Councils and the Local Government Board for enforcement of duties on the local authorities.

It is somewhat difficult to understand the reasons which have led the Local Government Board to entrust Urban and Rural Councils with these duties.

I have no doubt that many of these councils do their work admirably, but it cannot be said that, as a whole, they have hitherto shown themselves particularly zealous or efficient in carrying out the powers they have under the Dairies, etc., Orders.

Although these Orders were made as long ago as 1885, 1886 and 1899, until recently a considerable number of councils had made no regulations under them, and where regulations exist, they have in many instances, been carried out in a very perfunctory manner.

The latest official information I have at my command is the 37th Annual Report of the Local Government Board, presented to Parliament this year. I there find that in 1907, the last year given, inquiries were held by medical inspectors of the Board in forty-five Urban and Rural Districts. Sixteen of these inquiries were as to the insanitary condition of dwelling-houses, defective drainage, and outbreaks of infectious diseases. On twenty-nine occasions the medical officers reported on the condition of dairies, cow-houses, etc., in the districts they visited; in three of these cases the reports were of a fairly satisfactory character, but in seventeen instances

regulations under the Dairies, etc., Orders were either not enforced, or only in an unsatisfactory manner, while in nine districts the councils had not, at that time, made regulations.

This is hardly calculated to inspire confidence as to the manner in which these local authorities would be likely to deal in the future with dairies, cowsheds, and milkshops under the Bill.

From all points of view, it would seem preferable to place the administration with County Councils.

In the first place it is desirable that the authority, for the purpose of the Bill, should deal with large, rather than small areas.

In the second place, it is, in my opinion, vital to the success of the Bill that the authority should be one in which those concerned would have confidence.

Thirdly, I believe that County Councils could carry out the work, not only more efficiently, but more economically. They have already a staff of veterinary inspectors, which could readily be increased, if necessary, and they have the assistance of officers with greater knowledge and experience than minor local authorities can command.

Lastly, the authority should, from an administrative point of view, be the same as that for the purposes of the Diseases of Animals Act (1894 and 1903), entrusted with the administration of the provisions of the Tuberculosis Order of the Board of Agriculture.

Another objectionable feature of the Bill is the power given to an officer of a local authority, under certain circumstances, to enter and inspect dairies and dairy cattle situated without the district, and to a local authority to deal with milk supplied from the area of another local authority.

This procedure appears to have been taken from private Acts, which have conferred similar powers on the London County Council and the councils of other large municipalities, and which has been found to cause considerable friction between the local authorities concerned, and to be unnecessarily vexatious and irksome to dairy farmers.

These incursive powers, violating as they do the principals of local government, are only justifiable if absolutely necessary for the effective stoppage of infected or suspected milk.

This, however, would not appear to be necessary in the case of Scotland, even in the view of the Government. The milk and Dairies (Scotland) Bill provides that when diseases are attributable to milk coming from without a district, information shall be given to the medical officer of the district in which the dairy is situated,

and it would be his duty to forthwith examine into the case and report to his local authority, who would then deal with the question of stopping the milk supply. This is the procedure which is now in force under Section 60 of the Public Health (Scotland) Act, 1897, and it is to be presumed that it would not have been introduced into the Scotch Milk Bill of this year had not experience proved it to work effectively. There is, therefore, no good reason why a similar procedure should not be found equally efficient in England, nor why it should not be substituted for the ill-advised proposals in the English Milk Bill.

I have endeavoured to explain the main objections which those interested in the dairying industry take to the proposals of the Local Government Board, but a consideration of the Bill would be incomplete without reference to the Tuberculosis Order which the Board of Agriculture have issued in connection with it.

I do not wish to enter into a discussion as to the possibility, or, what is more important, the probability, of the transmission of tuberculosis from affected bovine animals to man, but it will be generally agreed that milk from such animals should not be supplied for human consumption.

The Tuberculosis Order of 1909 therefore, which provides for the compulsory slaughter of cattle obviously tuberculous, is a desirable and necessary supplement to the Bill.

Although the Order includes in its operation not only cows and heifers, but all bovine animals which are emaciated from tuberculosis, its main object is protection to the public health from risk of the spread of tuberculosis by means of milk, rather than the eradication of tuberculosis in animals.

When Mr. (now Sir Thomas) Elliott gave evidence before the Royal Commission on Tuberculosis in 1896, the Board of Agriculture were undoubtedly averse to giving powers to local authorities to slaughter animals with a view to extirpating tuberculosis, and as the Board have shown no inclination to adopt this policy from that time until the question of legislation as to the milk supply arose, I feel justified in assuming that their views on the subject remain the same.

As a matter of expediency, if not of justice, the payment of compensation to owners of cattle compulsorily slaughtered is necessary, for without it slaughter could not be effectively enforced.

The scale provided by the Order appears to be adequate and fair, but the proposal to place the whole cost upon the county ratepayer is, to my mind, indefensible.

I believe the principle that cost incurred for the benefit of the

public should be paid from the general taxation of the country is sound, and will not be disputed.

Local taxation for this purpose therefore is manifestly unjust to the ratepayers, while local taxation on the basis of the Order payable by county ratepayers only, is both unjust and unequal.

The greater part of the milk produced in the country is consumed in our large cities and towns, practically all of which are county boroughs, and do not therefore contribute to the county rate. It follows that those who will benefit most by the purer milk supply, which it is hoped the Order will tend to secure, will contribute least towards compensation, whereas the greater part of the cost will fall upon the county ratepayers who are comparatively small consumers, and the great majority of whom are not producers of milk.

Under these circumstances, I think the House of Lords were justified in declining to give a third reading to the Milk and Dairies (Scotland) Bill, until such time as the Government were prepared to provide some portion, at any rate, from imperial funds, of the cost of compensation for slaughter under the Order of the Board of Agriculture.—The Earl of Northbrook in *Live Stock Journal Almanac.*

How to Use Manure.—To be able to understand the proper principles upon which to manure successfully, it is necessary to have some knowledge of the general requirements of plants with regard to food, and the peculiar requirements of the particular plants we wish to grow, as well as to know what foods our soil provides in sufficient quantity, and which of them our plants are likely to find deficient. It is upon the knowledge of these points that not only the growth of good crops depends, but the profit from the use of manures.

The elements required by plants in their food are nitrogen, phosphorus, potash, lime, sulphur, iron, chlorine, magnesium, carbon, hydrogen and oxygen. The last three are almost entirely obtained from water and the gases of the air, so we need not concern ourselves about them, but all the others are taken up from the soil by the roots of the plants in the form of solutions of chemical compounds in water. It is probably worth while noting that no green plant can take up and use as food any animal or vegetable matter until it has decayed and been broken down into substances that not only are soluble in water, but in most cases, if not all, are colourless and odourless as well; in fact the plants can use as food nothing but what would be commonly described as "chemicals."

Every natural soil contains all the elements required by plants, though they are not always in sufficient quantity or in the correct

proportions to produce what we call a good crop. The constituents most commonly deficient in soils are nitrogen, phophates, potash and lime, and if any one or more of these is only available in small quantity, the growth of the crop is limited by that deficiency. Again, certain crops have more difficulty in obtaining a sufficient supply of a particular element than others, even from the same soil. Wheat, mangels, and rye grass, for example, are influenced almost entirely by the supply of available nitrogen, the strong root system of these plants enabling them to obtain a sufficient quantity of the other ingredients from almost any kind of soil. On the other hand turnips, barley and clover all find a difficulty in obtaining sufficient phosphates, while potash is often in too small quantity for clover and beans, and is the special requirement of potatoes. Lime is more often required for its effect on the soil than as plant food, but a crop like sainfoin cannot grow without an abundant supply, and clover and beans do badly where lime is deficient.

The variations of the different soils with regard to the quantities of available nitrogen, phosphate, potash, and lime they supply naturally are very marked, and every farmer should endeavour to find out the particular deficiencies of his own peculiar soil. In a general way, all clay soils are deficient in phosphates, but are well supplied with potash. Most clays contain a fair amount of nitrogen, but owing to their cold nature, it does not become available for plant use till too late in the spring for early crops. Certain clays are very deficient in lime. The boulder-drift clays capping the hills of Norfolk, Suffolk, Essex and Cambridgeshire, usually contain a fair amount of lime, but like the clay soils on the chalk, may become deficient in the upper layers.

Sandy soils are nearly always deficient in nitrogen, potash, and lime. The greensand of Kent, Surrey, Bedfordshire and Cambridgeshire contains, however, abundance of potash. The Bagshot sands of Essex, Surrey and South Hampshire also contain very little phosphate, in fact, they are naturally the poorest soils, as regards plant food, in Great Britain. The red dark sands and loams of Cornwall, Devon, Somerset, Hereford, Monmouth, parts of South Wales and the Scottish border are well supplied with phosphates, and often with nitrogen, but in many places require both potash and lime. The lighter red sands of Lincolnshire, Nottinghamshire, Warwickshire, Shropshire and Cheshire are always badly in want of lime and often of potash. Chalk soils often contain fair quantities of phosphate, and, of course, lime, but are commonly deficient in potash and nitrogen. The fen or peat soils contain, naturally, everything required by plants, but there is a large excess of nitrogen

and a deficiency of lime. The various loams and mixed soils partake of course, of the nature of their components and vary according to whether the clay, sand, or chalk predominates. These, as a rule, are the easiest soils to cultivate, require the least skill in getting good results, and accordingly command the highest rents.

We thus see the reason why certain soils are classed as turnip and barley or wheat and bean land, and why it is that certain land grows a particular crop better than another. The art of manuring comes in when we wish to grow a crop upon a soil not naturally suited to it, or when we have to make up in a soil the substances likely to have become deficient through the growth of previous crops.

The standard manure of the farm is, of course, farmyard manure, and however much it is necessary to recommend chemical fertilisers for particular purposes, it is always assumed that farmyard manure has been, or will be, applied in the usual course of good husbandry. Farmyard manure of good average quality is found to contain in every ton about 12 lbs. of nitrogen, 5 lbs. of phosphoric acid, and 14 lbs. of potash. It contains, of course, all other plant foods including lime, but no application of farmyard manure will supply sufficient lime to a soil requiring it. It may be noted too, that the composition of carefully treated farmyard manure does not vary so greatly as some farmers imagine. With store animals, consuming straw, hay and roots, with little or no cake, the quantity of nitrogen per ton may fall, perhaps, to 10 lbs., or when large quantities of cake are fed it may rise to 14 lbs., but the other ingredients will remain much the same. The factor that makes the greatest difference to farmyard manure is the washing away of the soluble compounds of nitrogen by rain. It is upon these soluble compounds that the immediate effect of farmyard manuring depends. If they have been washed away, so that the plant has to depend on the slow decomposition of the insoluble substances remaining, it will make no striking difference to the growth whether there are 8 lbs. or 10 lbs of nitrogen present, for all is insoluble. It is probable that about one-half of the fertilising ingredients of farmyard manure are available for the plants during the first season, rather more in a sandy soil and less in a clay, and that some of the remainder become slowly available for the next three or four years, but there is always a residue, perhaps one-eighth or one-tenth of the whole which for practical purposes is never available at all.

It is this slow decomposition that makes any manure a lasting one, and a manure that decomposes or is available to the crop slowly, will last, whether it is a natural or a chemical one. But a

crop must be provided with a sufficient quantity of the ingredients it requires in a readily available condition, or its growth will be retarded. If we want a crop of wheat or barley or mangels this year, it is foolish to apply a manure only one-half of which can become available for the use of that crop. To have a residue remaining so that our land is not exhausted but rather improved, is excellent, provided our crop has obtained all that it could possibly require, but to starve one year's crop so that we may have a residue for the next is the reverse of good or profitable practice. These facts with regard to lasting manures must be carefully borne in mind when selecting suitable substances for use in addition to the natural manure of the farm.

Farmyard manure could not possibly make up a deficiency in phosphate in a soil owing to the small quantity of this substance it contains, and the supply of nitrogen and potash to a crop will depend on the rapidity with which the manure decays. On a friable soil containing a fairly large percentage of lime and phosphate, farmyard manure is an ideal manure and supplies everything that our crops are likely to require. To apply farmyard manure to a soil dificient in phosphate in sufficient quantity to supply the plant with all the phosphate it requires, would result in a waste of both nitrogen and potash. The proper course is to give an ordinary medium dressing and then to make up the deficiency in phosphate by adding 2 cwts. or 3 cwts. per acre of superphosphate, basic slag, or some other phosphatic manure. The same rule would apply to potash, should that be the deficient substance.

In the case of nitrogen, all soils, with perhaps the exception of a few fen or peaty lands, require nitrogen when such crops as wheat, oats or mangels are to be grown. There is no doubt that where it can be obtained, farmyard manure is the thing to apply, but it is not always available. The following substances may then be used. For rapid action in the early spring or on cold clay soils, nitrate of lime containing 13 per cent. of nitrogen, or nitrate of soda, containing 15½ per cent. of nitrogen, either of them at the rate of from 1 cwt. to 2 cwts. per acre. When a more slowly acting and sustained action is required, sulphate of ammonia, containing 20 per cent. of nitrogen at the rate of from ¾ cwt. to 2 cwts. per acre may be used, the smaller quantity for such a crop as turnips and the larger for, say, potatoes, with intermediate quantities for corn crops. Soot also supplies sulphate of ammonia equal to about 3½ per cent. of nitrogen, and may be used at the rate of from 6 to 10 cwts. per acre for similar crops. More slowly acting nitrogenous manures are blood manures, meat meals, hoofs and horn, and shoddy. These manures act much

more slowly on heavy than on light land, and should only be applied to crops having a long period in which to grow.

For manures supplying both nitrogen and phosphates, a mixture of one part of sulphate of ammonia, and 3 or 4 parts of superphosphate may be used, giving from 3 cwts. to 5 cwts. per acre of the mixture. Both phosphates and nitrogen are contained in varying quantities in fish guanos, Peruvian guanos, and also in bone meals or dissolved bones, though the percentage of nitrogen is small in these in proportion to the phosphates.

Where phosphatic manures alone are required in a quickly acting form, superphosphates containing from 26 to 35 per cent. of phosphate rendered soluble are probably the best form in which to apply it. Basic slag acts more slowly, though with considerable rapidity on grass on heavy land, and it also contains lime. Steamed bone flour and bone ash are slowly acting forms suitable for light land, and of course dissolved bones or raw bone meal may also be used to supply phosphates, although they contain a little nitrogen. Although all phosphatic manures are fairly lasting, it is a waste of money to apply large dressings. A corn crop can use up nearly the whole of 2 cwts. of 26 per cent. super in a season, and a grass crop about 3 cwts.

The potash manures are all soluble in water, and all are quickly acting. Kainit, which contains about 11½ per cent. of potash, as well as some common salt, is especially suitable for use on light land and for mangels on any soil. A suitable quantity is 2 cwts. per acre for corn and grass, and 4 cwts. for mangels or potatoes. Sulphate of potash should contain nearly 50 per cent. of potash, and is particularly suitable for potatoes. Muriate of potash contains about 46 per cent. of potash. Sulphate or muriate of potash should be used in small quantity, ½ cwt. being sufficient for corn crops or grass, and 1 cwt. per acre for mangels or potatoes.

Mixtures containing phosphates and potash can be made by mixing any of these potash manures with any of the phosphatic manures. No harm results from mixing them, provided they are kept dry. A useful mixture is 2 parts of kainit to 3 parts of superphosphate, or one part of sulphate of potash to 6 parts of superphosphate. When mixtures containing ammonia, potash, and phosphate are made, it must be remembered that basic slag should not be used. Lime must in no case be added to a mixture.

With regard to the relative effects of nitrogen, phosphates and potash on the crops, whether existing naturally in the soil or added as manure, nitrogen always increases the growth of leaf and stem, phosphate increases the yielding power of corn and brings the crop

earlier to harvest, potash stiffens the straw and increases the sugar content in roots, and phosphates and potash together increase the feeding qualities of grass.

This sketch of the principles upon which manuring should be conducted is necessarily too brief to include many details, but I hope that it may be helpful to the farmer who reasons out, from a knowledge of his soil and the manures at his disposal, the treatment most likely to bring about what he requires.—W. M. TOD, in *Farmer and Stockbreeder Year Book.*

Feeding of Dairy Cattle.—In arranging the methods of feeding cattle during the autumn, the stock-keeper should bear in mind the specific ends it is desired to secure. Thus, in order to encourage the production of milk it is necessary to seek out those food constituents which are most likely to stimulate the lacteal functions into unfailing activity. Recent investigations have shown the uselessness of using the various groups of food ingredients in a haphazard manner. Both from an economical and a profitable point of view, these substances, which tend to encourage the production of milk, should be given in certain definite proportions. It would, of course, be impossible to adhere to a rigid, inflexible course of feeding, for the digestive capacities of dairy cows vary considerably. To attain the desired ends, the stockfeeder must exercise considerable judgment, a quality which is solely the outcome of long experience. In the course of recent experiments it has been shown that the value of a foodstuff is only determined by the digestibility of the food constituents contained therein. For a cow weighing approximately 1,000 lb. it is computed that 16 lb. of nutriment are required daily. The ingredients of such food should include at least 2 lb. of protein or nitrogenous matter, while the proportion of carbohydrates should be as much as 12 lb. These constituents must always be fed in this proportion as far as practicable, in order to encourage the production of milk.

As regards the proportion of fatty substances, some interesting experiments have been carried out in Germany by Professor Kellner, of the Möckern Agricultural Experiment Station. The general tendency of the experiments was towards cheapness in the production of milk. They involved the substitution of digestible fat for a certain proportion of the digestible carbohydrates; the results, however, showed that no benefit is derived from such substitution, and that the percentage of fat should preferably be kept within moderate limits. They further demonstrated that the best results are to be obtained by giving an equivalent amount of carbohydrates

instead of large quantities of fatty foods. It is, of course, evident that the first named food ingredients can usually be produced inexpensively on the farm, whereas fatty foods have to be obtained from other sources at considerable expense.

In regard to the feeding of dairy cattle, there are many commodities which will suggest themselves to the observant mind as being of high nutritive value, and at the same time combining with their feeding value the somewhat rare quality of being economical. Thus, for example, rice-meal has been quoted by many authorities as a very useful food for milk production, as those farmers who have fed it to their cows well know. It is more particularly valuable on account of its comparative cheapness. Being rather deficient in nitrogenous matter, rice-meal must be fed in conjunction with some other concentrated food rich in this important element of animal nutriment. Bean meal or cotton cake can be profitably employed for this purpose, also linseed cake; the latter is, however, more expensive and of less value than cotton cake. For an average Shorthorn dairy cow of 1,000 lb. weight, 5 to 6 lbs. of rice-meal may be introduced with advantage into the winter rations, although these amounts will, of course, be largely determined not only by the weight of the animal but also by the nature of the other foods which are being given. An analysis should always be obtained when purchasing this commodity, and it is equally important to see that the meal is in good sound condition, free from rancidity or damage.

A valuable addition to the winter rations of dairy cows is provided by oats, maize, and barley grains. Of these, oats are undoubtedly the best; these grains have a marked effect in stimulating the flow of milk and assisting in the production of butter of good quality and flavour. Notwithstanding their high market price, they may often be profitably included in the winter dietary, only the inferior samples, unsuitable for horse-feeding, being employed for this purpose. Maize is usually included in cattle foods in the form of a meal; it is, however, somewhat heavy in this form, and requires to be lightened with chaff, straw, or bran. Maize is a particularly inexpensive foodstuff, and this is perhaps its only recommendation as food for dairy cattle. Being possessed of little nitrogenous matter, it should always be given in conjunction with other concentrated foods which are particularly rich in albuminoids. Barley grains, like maize, are hard, and require to be crushed into meals like oats before they can be given to dairy cattle.

Brewers' grains are used extensively as food for milch cows, especially in the neighbourhood of large towns. They contain a greater percentage of nitrogenous matter, or albuminoids, than barley;

in fact, the proportion of albuminoid nitrogen per 100 parts of total nitrogen is 98; a higher percentage than any other feeding stuff. The average composition of brewer's grains may be taken as follows:

	Wet.	Dried or Desiccated.
Water	76·4	12·0
Albuminoids	5·0	18·5
Fats	0·5	8·2
Carbohydrates	10·8	49.4
Fibre	6·0	7·6
Ash	1·3	4.3
	100·0	100·0

It is evident that these two foodstuffs are both rich in nitrogenous matter, although we cannot, of course, make any comparison between the two. The wet grains contain a plentiful supply of water, and there is much nitrogen present in the dry matter. For these two reasons alone, they form a most excellent and beneficial food for milch cows, the water being notoriously beneficial in stimulating the milk yield. The wet grains are, however, by no means a concentrated food, and in this way differ from the dried grains, which, it can be perceived, contain but little water.—" J.C.N." in *Live Stock Journal.*

Thick and Thin Seeding.—It is necessary to hold correct views as to the proper quantity of seed to sow per acre. I was under the impression until very recently that all good farmers were agreed that less seed is required for good than for bad land. In this it appears I was mistaken, and, had it not been for a somewhat bold statement that good land requires to be thickly seeded, I should have felt that to impress an opposite view might have laid me open to a charge of telling readers what they all knew. I had on one occasion, years ago, to enlighten a good ploughman on the subject, as he had a mistaken view which he expressed in a very happy way. He said " Well, sir, a poor man cannot support as big a family as a rich one." *Ergo*, rich land can carry more plants than poor land. This is quite true as a statement, but the cases are not parallel. With land it is only rich soils in which plants can tiller, or develop to their full ability; and if such soils are over-seeded at the outset the plants will soon interfere with each other's growth. If too much seed is sown on rich land the tendency in the case of cereals is to develop a grassy herbage, which will later produce weak straw and small heads. If, however, the seed is reduced in quantity, the plants branch out, and form extremely stout and reed-like straws, surmounted by large heads well filled with grain. On such land oats

may be drilled as wide as 13 inches. I have just secured a very fine crop of oats sown upon my lambing pen, which, with the exception of a small bit, stood up well to the self-binder.

These oats were purposely sown thin, at the rate of about $2\frac{3}{4}$ bushels to the acre, but the crop was as thick as was consistent with standing up. The straw was as stiff as light bamboo canes, and the heads contained up to 180 or 190 oats each. If I had put in more seed it would have been laid and twisted for the binder, and the crop would have been down flat.

Next as to poor land. Thick seeding does not necessarily mean a thick plant on poor land, although it does on rich land. Plants die out or disappear in large numbers, and however thickly (within reason) such soils are seeded they are often insufficiently stocked with plants before the ears begin to shoot out. There is no tendency to tiller on poor land, and each plant only sends up one or a very few straws. The consequence is a puny crop not too thick upon the ground ; and in order to avoid blank spaces and a thinly placed crop it is necessary to sow four or five bushels of oats per acre. The same quantity of seed sown on rich soil would be too thick, and the plants would tend to become thicker still through tillering. They would interfere with each other's development, and spindle up into weak straws which would possess no strength to stand up against storms.

What is true of cereals is still more strikingly true of root crops. In Scotland swedes are sometimes drilled in rows a yard apart, and are set proportionately wide. On poor land the ridges are raised narrower, and the plants are left closer, which, of course, is the same as thicker seeding. It may, therefore, be considered as an axiom that rich land ought to be less thickly seeded than poor land, not because it cannot support so large a family, but because a smaller number of plants will so develop as to fill the entire available surface. Similarly poor land should be thickly seeded, not because it can support a larger number of plants, which it cannot, but because it is necessary that the entire surface should be covered with plants at the outset, as such land cannot stimulate branching, tillering, or shooting out. The plants grow erect and develope few side shoots and are in little danger of encroaching on their neighbours. The area of their influence is small and even a closely neighbouring plant is beyond its confines. The plants from seed sown on good land soon begin to tiller out, and require room for their full development. The act of tillering must not be regarded as an effort, or as a "striving," to fill up vacant spaces, but merely as the result of prosperity. If cribbed and confined by thick seeding the plants tiller, but consequently grow rank and become weak. Barley is

not quite on a par with oats and wheat in this respect, for thin-seeded barley may produce a coarse quality of grain. In other cereals quantity is less likely to interfere with quality, and is, in fact, the principal object of the grower, Barley may be sown too thinly on rich land, it is true, but it should certainly be sown more thickly on poor soils.

It would greatly surprise the old thin-seeders of last century if they could be told that rich land ought to be more thickly seeded than poor land. Their most striking successes were achieved upon the best land they could find, and they recommend early sowing in order to promote tillering. As to thin seeding on poor land, the late Mr. W. J. Edmunds, of Southrop, in Gloucestershire, found that thin seeding on the poor soils of the oolite was not only inferior to thick seeding, but that his thinly-seeded ridge came to nothing, the plants being few and far between, and over-grown with annual weeds. On the other hand, a thin plant on really good land will continue to tiller until it occupies every inch of the surface, and at length develops into an upstanding level crop, composed of reedlike straws, surmounted with big heads.—JOHN WRIGHTSON in *The Agricultural Gazette.*

Hop Picking by Machinery.—A hop-picking machine has been invented by Mr. E. Clemens Horst. The invention of this apparatus was a consequence of the San Francisco earthquake, the labourers required to pick the hops on Mr. Horst's fields in Califorina not being forthcoming at reasonable prices because they found reliance on relief funds more congenial than work. The machine is erected at any convenient point, and the hop-vines are collected bodily on the fields and conveyed to it in wagons. One advantage claimed for this arrangement is that it becomes possible to select those vines which are mature, and those which are not quite ready may be left for a few days; whereas, with hand-picking, the vines must be stripped, whether they are properly matured or not. With the machine, hand labour is required only for fixing each vine as it is unloaded from the wagon in the travelling frame of the apparatus, and this is done simply by hooking the stem round a pin.

The frame draws the vines over a series of 16 drums revolving rapidly in the opposite direction to that in which it is travelling, and V-shaped fingers on these drums, to the number in all of about 12,000, catch the hops and break them off. These fingers are so shaped that they do not become clogged and so as to strip off as few leaves as possible. Some leaves are, however, unavoidably removed, and the machine includes two devices for separating the

hops from them. Finally the hops, by means of a conveyor, are deposited on the floor of the drying house, where they are dried by air warmed by the exhaust steam in about two minutes after the vines have been fed in. A machine, which costs about £300 to build, can deal with vines to the number of 16 a minute, and it is found than an average output of about 50 lbs. of hops a minute can be obtained, though the rate sometimes rises to 6,000 lbs. an hour.

Last season some 8,000 bales of hops were harvested in California by means of such machines, and next season it is expected that the amount will be increased to 25,000 bales. The machine is being introduced into Oregon and British Columbia. Besides rendering the hop grower independent of the caprices of casual labour, the employment of machinery is said to augment the yield and improve the quality, because the crop can be completely harvested in a week or ten days.—*Agricultural Gazette.*

Pedigree Dairy Shorthorns.—Mr. George Taylor, in a paper recently read to the Bishop's Stortford Chamber of Agriculture, stated that looking back upon the changes which had taken place in agricultural practice within the last 20 years one could not fail to be struck by the tremendous impetus which had been given to dairy farming. There were very few districts in England to-day in which the dairy cow was a stranger; he meant in the sense that a dairy herd was not kept, for every farm naturally supported a few dairy cows for milk production for household use. To a very great extent farmers had looked to the dairy cow to pay the rent. Land had been laid-down to grass and special crops grown with the one idea of feeding the milk producer. It was, therefore, only natural that under these conditions the breeder of pedigree dairy Shorthorns should turn with renewed interest to develop the milking qualities of that breed. In the olden times they had a sharp division between the milk and the beef Shorthorn. To some extent they had it to-day, for both these qualities in the red, white, and roan were cultivated by the provision of special classes at the leading shows. It was a good sign when breeders realised that the Shorthorn was not intended for one purpose only, but that its extraordinary adaptability should be turned to whatever use the farmer found for it. When Amos Cruikshank gave to the world what was known as the Aberdeenshire type of Shorthorn, to a very large extent he revolutionized that breed, and the wonderful successes which followed the Scotch animal and the progeny of the Scotch cross in the showyard temporarily diverted attention from the other highly important qualifications of milk production. But that could not last

very long, as there were too many inquiries for bulls of long pedigree and of dairy type, that was to say with milking blood in their veins, to enable breeders to neglect that highly important quality in the Shorthorn. There was room enough in England to-day for all sorts and conditions of live stock; and if we were still able to maintain what might be called the local breeds of domestic stock in a flourishing condition, surely it was not too much to expect that the enthusiasm of breeders would find a place for Shorthorns which would produce milk as well as Shorthorns that carried beef. For many years he had been a breeder of pedigree milking Shorthorns and had taken some little part in the organised efforts to place the pedigree milking Shorthorn on a secure footing. It was only the natural result of devoting attention to the lacteal properties of this breed that definite steps should be taken to bring it prominently before the public. Therefore when the Shorthorn Society decided eleven years ago to give £200 in prize money for dairy Shorthorns eligible for Coates' Herd Book there was a strong feeling manifest among breeders that the classification this afforded should be well supported. It took a year or two, however, to enable these classes to justify themselves, and now they had at the leading shows an entry such as anyone connected with dairy Shorthorns might be proud of. Arising out of this movement, an association was formed which might be described as a league of breeders who were interested in the propagation of milking qualities in the pedigree dairy Shorthorn. This association was called the Coates' Herd Book Dairy Shorthorn Association.

When establishing a herd of pedigree milking Shorthorns, one must naturally look to the cow with dairy characteristics. He would place first and foremost a kindly head and shapely bag, with well-shaped teats. Constitution must not be neglected, and he attached great importance to the selection of bulls, if they intended to breed a milking herd. He thought, whatever the extra cost might be, it was money well laid out if anyone, before buying a bull, would go to the herd where it was bred and see his dam, and, if possible, his sire also. The influence of the dam was specially pronounced in milking pedigree Shorthorns. This policy he knew was followed by many of the best breeders of horses, who considered it of greater importance to study the character of the dam than even the character of the sire. There was such a great demand for bulls nowadays that he urged particular attention to this, for so far as he was personally concerned his supply could not meet the demand fast enough. In laying the foundation for a herd one naturally looked a good deal to blood, and in a milking herd the old Bates

families were essential. Yet one could not altogether—having regard to the foreign demand for long pedigrees and to the high prices paid for really good bulls—neglect the Scotch cross. If he might draw from his own experience, he might say that one of the best bulls he ever used was got by a Cruikshank sire. One could not expect bulls bred with a strong milking pedigree to look quite the same as those which were the product of beef strains alone. These latter one might expect to be much thicker, and blockier near the ground, and deep through the heart; but if they got bulls of ample frame with their lines right and colours good, with a nice amount of flesh, they had no difficulty whatever in finding customers at remunerative prices. Here he might, perhaps, be allowed to say a word on the question of milk and beef. His experience led him to the conclusion that milk and beef were very difficult to get right through the herd; that was to say, one naturally expected in a herd which was devoted solely to producing animals of a beef type to find them more perfect there than in a herd whose chief duty was to fill the pail, and *vice versa.* They might maintain the ideal of milk and beef in the one animal, and this could be got in individual cases, but, as every practical breeder knew, their heaviest milkers often made the poorest show of flesh, so that he thought they ought to be content that their pedigree dairy shorthorns, while they were filling the pail should perform that duty satisfactorily and when they went dry show a ready aptitude to put on flesh. He should not say that the pursuit of milk and beef in one animal was altogether illusory, for so long as the Shorthorn was the Shorthorn they must necessarily cultivate both qualities; but he would indeed be a fortunate man who could find all the best qualities of the dual type combined in one herd, as they occasionally found them in individual animals.

He might, perhaps, be permitted to say a word on milk records. Every business man liked to know how much profit his farm was paying. He naturally kept accounts, and applying the same principle to the pedigree dairy Shorthorn it was necessary to know exactly what their cows produced. It was not only satisfactory to themselves and all-important from a breeding point of view, but it gave confidence to those who were looking for animals of the milking type when they found that the dams had produced stated quantities of milk during their fruitful years. Some of those present might have studied the elaborate series of milk tests conducted by the Highland and Agricultural Society in the south and south-west of Scotland. These were conducted by the late Mr. John Speir, than whom there was no more practical authority, and he told the lecturer

that the Ayrshire cow had never had a finer advertisement than this series of herd tests. He also said that in herds where no records had been kept before, they found cows which had been giving over 1000 gallons of milk, while others were only giving about 400 gallons. These results had very materially improved the demand for calves out of the best cows. What applied to the Ayrshire would also apply to the pedigree dairy Shorthorn. When he first started keeping milk records his herd average was not 600 gallons annually. Now it exceeded 800 gallons, and he rarely kept a cow that did not yield 700 gallons per annum. His system was to take a weekly record (every Wednesday). He did not pay very much attention to the quality of the afternoon's milk, because he knew it was much above the standard ; but as he supplied an institution every morning with 40 gallons, which they tested daily, he asked them to report to him at once if the milk was not quite satisfactory. He sampled the other morning milk occasionally, and had it analysed by Mr. Lloyd. The results clearly demonstrated the positive necessity of only keeping cows which paid their way. It was difficult to speak of the management of a dairy herd in decided terms, because so much must necessarily depend upon the facilities for getting food and the nature of the markets in which the farmer bought his provender. In the summer time they all adopted the same system and depended upon their grass fields for food. The freshly calved cows got a little extra allowance of cake. The cows were always tied up to be milked and when they were tied up was the best time to feed them, as one could vary the rations according to the yield of milk. Generally speaking, the amount of cake they had ran from 2 lbs. to 8 lbs. per head daily, and at no time was it more than the maximum amount mentioned. Very often one had the opportunity of buying special foods at a cheap price. Thus, last year, they were enabled to purchase old beans at a low figure, varying, as far as he remembered, from 33s. 6d. to 35s. per quarter. Now they were very dear. Generally he fed a little Thorley or Waterloo cake and also used linseed and cotton cake. As to the sheds, he was a strong believer in sanitary mangers of the glazed drain-pipe type. He had them everywhere. The old wooden mangers became very stale and smelt very strong, the food got into the corners, with the result that they caused waste through not being properly cleaned out by the cows. During winter he always kept the herd in night and day, but strongly approved of the policy of allowing them out to get a supply of water. He allowed them to run into the yard to the water which was laid on there, and if they were untied twice a day for this purpose it prevented them becoming crampy and out

of health. It took roughly two hours to water his cows properly, and this meant a couple of men attending to them, which was perhaps an additional expense; but he thought he quite saved it in other directions. He had had the water supply cut off altogether in the houses. The bulls were kept in open sheds, and under these conditions he did not think they need fear breeding tubercolosis. It was necessary to have proper ventilation and light, for the comfort of the cows meant a larger milk supply. With regard to the cropping for winter needs he mainly grew mangels, as nothing was so satisfactory for feeding in the winter time. In the matter of green food, maize and cabbages came in very handy. Maize was splendid for feeding on the pastures from August onwards when the grass began to lose its virtue or became short in supply. They sowed the maize about the middle or third week in May and cut it from the beginning of August onwards. It would grow to about six or eight feet high and was cut before it could shoot the cob. They sowed about two bushels to the acre and drilled it in rows about 21 inches apart, in the ordinary way. It was cut just when it was wanted and carted direct from the field into the pasture where it was thrown to the cows. These in the main were his views on the pedigree milking Shorthorn. Much more might be said concerning it, particularly from the point of view of breeding and blood. The success of the individual breeder was, after all, a personal matter, and while it was impossible to attain it without dipping deeply into old families which would breed true, it was also improbable that success would be obtained merely by using old blood. It was necessary to make use of it with discretion, and if the individual was not possessed of an eye for a good animal he might labour long with comparatively little reward for his trouble; but anyone who really liked a good Shorthorn and knew one when he saw it, provided he had a little capital, should have no trouble whatever in building up good milking strains if he studied blood closely. In the course of time they might be able to publish milking records in a special herd-book, and that object was, he thought, worth keeping in view. They found this plan carried out in connection with Coates' Herd Book Dairy Shorthorn Association, and he believed by other breeds, such as the Red Poll and Jersey. If it would make our cattle more valuable to breeders and provide at the same time some guidance to future generations, he thought the policy of publishing under the auspices of a Society the milk records of individual cows as well as herds would be of the greatest benefit.—*Herts and Essex Observer.*

Basic Slag and Potash for Chalk Land.—Under the above heading certain originally private correspondence between Mr. W. J. Passmore, of Applesham, Shoreham, Sussex, and Mr. John Hughes, the agricultural analyst, appeared in *The Field*, and the latter ventured to question the utility of the application of basic slag on essentially chalk land, though the application of potash salts might very reasonably be expected to be attended with satisfactory results. Mr. Passmore, in his reply, stated that in actual practice his experience was not in accordance with the expressed theory, and added that his faith in agricultural chemists was not as great now as it used to be some years ago when he started life as a farmer. He concluded his interesting letter describing the successful use of basic slag on the Sussex Downs by inviting Mr. Hughes to come and see the results. On November 2, Mr. Hughes paid a visit to the farm, which is delightfully situated on high ground, and as the day was beautifully fine and clear he was able to make the inspection under particularly favourable circumstances. The result of this inspection and of subsequent work are thus described by Mr. Hughes in *The Field :* I was shown grazing land on the Downs which had been dressed with slag alone and slag and potash salts, the results being a close, green, vigorous growth of herbage, upon which a number of young cattle were evidently doing well. At the same time grazing land that had not been so treated was pointed out to me, and the contrast between the thin brown herbage of such land and that dressed with slag and potash salts was very striking. There could be no doubt that the manurial dressing, whatever proportions it may have consisted of, had produced satisfactory results ; but it occurred to me that the important point to ascertain for future guidance was the particular composition of the soil operated upon.

It was quite correct to describe the soil as resting upon a chalk subsoil, but the dark appearance of the surface soil wherever exposed to view suggested that it could not be regarded as what is generally understood as a chalk soil. Samples of the turf about 3 inches deep were therefore taken from the slagged and non-slagged land, the turf from the former being taken from the spot from which the turf represented at the recent Royal Show at Gloucester had been obtained. The soil was in each case separated from the grass and roots and prepared for analysis in the usual manner, the analytical results being arranged to show the composition in the air-dried condition after exposure to the atmosphere in a dry room for a week.

Analyses in the Air-Dried Condition.

	No. 1. Slagged Soil.	No. 2. Not Slagged.
Water (lost at 212° F.)	2·94	2·37
*Organic matter and loss on ignition	15·63	11·64
Oxide of iron	2·78	2.22
Alumina	1·99	2·28
Lime	17·81	17·06
Magnesia	·15	·19
Potash	·72	·42
Soda	·05	·04
†Carbonic acid	11·73	10·16
Phosphoric acid	·30	·15
Insoluble silicious matter	45·90	53.47
	100·00	100·00
*Containing nitrogen	·60	·45
†Equal to carbonate of lime	26·66	23·09

From the above analyses it will be seen that these soils contain a very considerable proportion of vegetable matter in the form of humus, the percentage of nitrogen being respectively .60 and .45, and the success of slag must be ascribed to this fact. According to the definitions laid down by the late Dr. Fream in his useful book on the *Elements of Agriculture*, an ordinary chalk soil should contain only about 3 per cent. of organic matter with only .18 nitrogen and at least 28 to 30 per cent. carbonate of lime, which represents a very different quality of soil to that on which Mr. Passmore has the good fortune to operate. These Sussex Downs soils really consist of a thick layer of dark vegetable mould associated with finely divided particles of chalk, as the result of years of more or less continuous grazing, and this rich mould moreover rests upon a subsoil of chalk, which is naturally very hygroscopic, and, according to my analysis, retains from 15 to 18 per cent. of moisture. Consequently these Sussex Downs do not suffer from drought to anything like the extent that ordinary light or gravelly soils do, and they present a fresh, verdant appearance to the eye when viewed from a distance.

On examining the above analyses it will be seen that No. 1 contains nearly twice as much phosphoric acid and potash as No. 2., so that the manurial dressings must have been on a very liberal scale to have made such a large difference in the composition, for, according to ordinary calculation, it takes one ton per acre of an ingredient to raise the pencentage in the analysis to the extent of .20 for a depth of three inches. The slagged soil appears to have been better supplied with humus than the non-slagged soil, and possibly the spot selected for taking the turf was somewhat above the average quality. The analyses of the actual soils will, I hope, be practically useful in explaining in a scientific manner why basic slag has pro-

duced the satisfactory results which have been claimed for its application. At the same time these analyses should caution those who farm essentially chalky land not to expect similar good results from the application of basic slag, for without the presence of the large proportion of vegetable matter rich in nitrogen, and capable of holding a constant supply of water, it would not be reasonable to expect to obtain the particularly satisfactory results which Mr. Passmore has obtained on his farm on the Sussex Downs.—*The Field.*

An Anomaly in Agricultural Practice and its Solution. —Mr. John Porter, B.Sc., of the Edinburgh and East of Scotland College of Agriculture, in a lecture upon the above subject, said there was a business principle which might be stated as follows :— "The price charged for an article must bear some relation to its cost of production," or, in other words, the more labour which had to be expended in the production of any article, the greater must be the price demanded for it. The cake manufacturer, the manure merchant, and business men generally could only exist by adopting such a principle. The farmer bought his store sheep at market price in order to fatten them. He must pay his rent each year, and, in the purchase of feeding stuffs and farm utensils, lay out capital for which he was entitled to some interest. It was right, therefore, that he should be entitled to regulate the selling price of his fat stock, if it was going to prove a profitable transaction. But was this so ? By no means. He was entirely at the mercy of the buyer of his stock, and had to take the price offered and be thankful. The farmer was often in a difficult position at the auction mart : when he considered the price offered too small he must either let his stock go at a sacrifice or pay the carriage on them home again, feed them on, and take the risk of another market. Fat stock could not be stored and kept back until the market improved ; they must be sold. Herein lay the anomaly, since there was no relation between the price of production and the price which he had to accept. True, when the supply of meat was short, and the demand keen, the farmer might even get more than his due, but with an unlimited supply and a more or less limited demand, things very soon began to press hard on the farmer. Both cases were unsatisfactory. Under the present system the farmer had practically no security. The keen demand for mutton during the last two years tempted the farmers to try and meet this demand, with the result that mutton production increased. Things looked hopeful to the farmer for a brief moment. Suddenly, however, he found that his high price had tempted the foreigner also, and the market for mutton became

swamped. The foreigner was making a fair bid for their market. Chilling-houses were being put up in suitable centres where foreign meat could be stored and brought out at will. The foreigner was paying big sums of money to boom his meat, but the cruellest thing of all was that foreign meat was being palmed off to customers as "home-fed," which was a "national scandal." This difficulty would never be effectively overcome until foreign meat was stamped before being allowed into the country and also sold in separate shops. Farmers and scientific agriculturists were racking their brains to cheapen production. Agriculture was the foundation on which our economic system was built, and the nation could not afford to treat agriculture badly. As a matter of fact, they ought to make it worth the while of the feeder to devote his whole time to the production of sound, wholesome meat. The State could then demand a high standard of quality of meat, but it was impossible to do this so long as the feeder had to content himself with the present beggarly prices. No one did harder or more honest work than the farmer, and few people got less for doing it. Denmark, by controlling the quality of its dairy produce, had become famed throughout the world. With regard to beef, there was also a danger of the market being swamped by the products of Argentina. How was it that the Dane had crept into our market to such as extent with his produce? The answer was pretty evident to one who had seen his system. He did away with what might be called unnecessary expenditure by going straight to the consumer. This was done in the following way. A number of farmers within a suitable area obtained a loan of money from the banks or other sources, on personal security, and with it they built a bacon factory. Each farmer guaranteed a certain number of pigs each year, the feeding of which was controlled. When fat, these pigs were brought direct to the factory to be converted into bacon, which was consigned straight to this country or some other outlet which the Dane had for his goods. Compare this with our system, and they would find that it was very much better than if the buyers went round to the farms to buy the cattle and sheep, or the farmer sent his fat animals to an auction mart, where they were sold to the highest bidder. This latter transaction involved charges for commission, carriage on railway, customs, drover, and insurance to the amount of $2\frac{1}{4}$ to $4\frac{1}{4}$ per cent. of the amount received. There was also the cost of the farmer going to the market to see them sold. The above expenses amounted to as much as 1s. 6d. for every fat hogg and 10s. to 14s. for every fat bullock. The price the farmer got for his beef and mutton was not more than $6\frac{1}{2}$d. and 7d. per lb. respectively. This meat was

retailed to the consumer at 3d. or more per lb. above the price that the farmer got for it, the skins and offals coming in as extras. The proposal to hold conferences with the butchers was only tinkering with the business, and would not in any case permanently remove the difficulty. In order to solve this problem the farmer must go direct with his fat cattle, sheep, and pigs to the consumer. This would be a great boon to agriculture and the nation generally.

What they needed was a strong organisation, and it was important to keep in mind that in Denmark co-operation started with the large farmers. Under such a system the farmer would no longer be hampered by striking a bad market, or having his animals run through the sale late in the day after buyers were supplied. No; he would be paid on quality and weight combined, the prices being fixed each week for the different qualities. The retail prices would be fixed by the committee just sufficiently high to remunerate the feeder and keep the market from being slumped by the foreigner. Then they would have established the business principle whereby the price obtained was fixed at a remunerative figure, and did not leave the farmer dependent on the generosity of the butcher. One of the first effects of such a system would be to give security to the farmer, who would then be encouraged to produce the very finest quality of food for the people. The stimulus given to agriculture would encourage people to stay on the land or come back to it, and thus prevent rural depopulation. With more labour the land in Great Britain could be made to produce, on an average double of what it was doing at the present time, and this would render us less dependent on foreign nations for our food supplies. The State would, in all probability, encourage such a noble project, and do its utmost to raise agriculture to its well-deserved status. The system he advocated was capable of great extension. Then, too, the speculative element, which was such a curse to our nation in making folks discontented with reasonable profits, would be reduced to a minimum. There were great possibilities in front of them. They ought not to let the chance slip.—*Scottish Farmer.*

Improving Moss Land.—Principal R. Patrick Wright, of the West of Scotland College of Agriculture, recently lecturing on the manuring and improvement of moss land, said:—Two or three years ago they commenced a series of experiments which had for their object to determine whether moss land could be successfully reclaimed by the use of artificial manures. This was a question which had never been properly determined in Scotland or any other part of Great Britain, so far as he was aware. The experiments were carried out

on three farms in the west of Scotland. They were given certain areas of pure peat moss which had never been cultivated. The land was drained and fenced, two years ago, for the purpose of these experiments. It was afterwards cultivated on the surface for the most part by the spade, as in the first year it was not sufficiently dry to be cultivated by horse labour. The land was limed at the rate of four tons to the acre, and on one of the plots no further manure was applied. The other two had artificial manures in quantities he would mention. Potatoes, which was the usual crop in the reclamation of such land, were grown in 1908, and the same crop was planted in 1909, the second year of the experiment. He proposed to show them the amount of crop obtained in these two years. Now they were aware that at one time a good deal of moss land was brought into cultivation in this country by the efforts of farmers when artificial manures were not available. The common method was to drain the land, lime it, apply farmyard manure, and cultivate it in the ordinary way. Success was attained, and deservedly so. They had now tried artificials because they wanted to ascertain what these were capable of producing, for farmyard manure was limited in quantity, and required much labour to carry it to the ground, whereas artificial manures were unlimited in quantity, there was not the same difficulty in conveying them to the soil, and they could be applied at less cost if farmyard manure were assessed at its proper value. The artificial manures applied to Plot 2 in 1908 were 20 cwt. basic slag per acre, 6 cwt. of kainit, and 2 cwt. of potash manure salt, which, in addition to the cost of carriage and application, involved an expenditure of £4 0s. 6d. This was no doubt a heavy dressing of artificial manure, but a heavy dressing was necessary, and it did not cost as much as it would have been necessary to expend in applying 20 tons of farmyard manure. Then in 1909, there was applied to Plot 2 10 cwt. of basic slag and 5 cwt. of potash manure salt, at a cost of £2 13s. 9d. This was altogether apart from the lime. Now he would show them the results obtained. In the first year the had an average yield of 1 ton 13 cwt. of potatoes per acre on the plot which only received the lime, but on Plot 2 the yield was 5 tons 11 cwt. 1 qr., giving an increase for the artificial manures of 3 tons 18 cwt. 1 qr. Then, in 1909, the average yield on the plot which received lime only, was 1 ton 19 cwt. 1 qr., and that of Plot 2, where the manures were used, 7 tons 12 cwt., or an increase of 5 tons 12 cwt. 3 qr. Both these results indicated quite clearly that lime alone was by no means sufficient to cause an adequate improvement on poor moss land. That point was of some importance. It must be admitted that 5 tons 11 cwt. 1 qr. was by

no means a heavy crop, but it was to be remembered that the land in 1908 had not yet experienced the full benefits of the drainage. In the second year it was better, the yield being 7 tons 12 cwt., which was quite a good crop of potatoes from poor moss land treated in the way that had been mentioned, and the increase by the added artificial manures was brought up to 5 tons 12 cwt. 3 qr., which showed, of course, the very great efficacy of basic slag and potash manure. With regard to the values, it was perhaps a little premature to make a calculation, except to say that the artificial manures have given a very good return for the cost. In 1908 the increased produce by the use of artificial manures, taking the price of potatoes at £2 per ton, which was a very reasonable estimate, was £7 16s. 6d., while the cost of the manures was £4 0s. 6d., leaving a balance on the right side of £3 16s. 0d. In 1909 the average increase of 5 tons 12 cwt. 3 qr. was valued at £11 5s. 6d., and the cost of the artificial manures was £2 13s. 9d., giving a balance of £8 11s. 9d. so that for the two years the manured plots had given, as compared with the other plot, an average increase amounting to £12 7s. 9d. He did not refer to the cost of the lime for this reason, that lime was a manure, the effects of which must be considered as spread over a period of about ten years. This was a matter that would be considered as the experiment made further progress.

Another experiment covered a longer period of time, and showed more fully the effects of the manures applied to pasture. In this case the experiments were also carried out on moss land, and covered a period of six years. They took place at Midlocharwoods, in Dumfries-shire, where there was a field that had been drained a good many years ago. It had been cropped for a time, and then it had been laid out to pasture for twenty years or more. It was very poor pasture, and carried a small head of stock. Six years ago this field was made into three divisions. One of the divisions was left without any manure or treatment of any kind. The second plot received basic slag alone at the rate of 10 cwt. 92 lb. per acre. To Plot 3 there was applied the same amount of basic slag, with the addition of 8 cwt. of kainit. These manures were applied in the winter of 1903-4, and the experiment commenced in the summer of 1904. Then each of the plots was stocked with the number of sheep it was estimated it would carry. The sheep were weighed every month of the twenty weeks of the summer season during which the experiments lasted, and the results were noted. The college had the assistance of a committee of practical farmers, who advised them in the selection of stock and other matters. The number of sheep carried by the plots in each year was as follows :

Plots.	1904.	1905.	1906.	1907.	1908.	1909.
Untreated ..	7	5	5	6	6	6
Basic Slag ..	8	6	6	8	9	8
Slag and Kainit	11	9	9	10	10	10

The same class of sheep, as nearly as possible, was selected, and they endeavoured to get them of the same weight. They would observe that no manures had been applied since 1903-4. The immediate effect of these manures was so marked that it was found necessary to increase the stock on the manured plots. But the committee found that they had wholly underestimated the stock-carrying capacity of the manured plots. Accordingly, a number of cattle had to be put on those plots in 1904 for a certain number of hours to eat down the rough pasture, and give the sheep a chance. In 1904 eighteen cattle were put on the basic slag plot for twenty-eight hours, and in 1905 fifteen cattle were put on for six days. On the slag and kainit plot the growth was still more remarkable. There eighteen cattle were put on for 54½ hours in 1904, thirteen for ten days in 1905, and fifteen for nine days in 1906. Since then it had not been found necessary to put on any cattle. After the third year the effect of the manures in producing an increase of grass became less apparent, and it had been possible to keep them sufficiently cropped without putting cattle on at all. But even now, at the end of six years, the plots which received slag and kainit were carrying from four to six sheep more than the unmanured plot. He had mentioned that in the second and third year there was a remarkable growth of grass, more especially from the slag and kainit. In experiments carried out elsewhere, it had been found that the use of basic slag and kainit had given a remarkable growth of white clover, especially on clay soils, but in these experiments there was no particular growth of clover; it was purely the increased yield of grass. Apparently the effect of the manures had been to change the character and quality of the pasture. They might almost call it a permanent improvement.

The following table shows the increase in live weight of the sheep obtained on each of the plots :—

Year.	Untreated lbs.	Basic Slag. lbs.	Slag and Kainit. lbs.
1904 ..	68	94	130
1905 ..	55	80	102
1906 ..	45	75	89
1907 ..	48	93	115
1908 ..	42	80	80
1909 ..	49	83	103
Total	307	505	619
		307	307
Increase over untreated plot		198	312

A remarkable feature of the last year was that the manured plots did not show any evidence of diminution in production. It would give them a still more definite impression of the improvement that had been wrought if he gave them a calculation showing the value of the increase compared with the cost of the manures applied. The basic slag increase of mutton was 193 lbs. live weight, which at 3d. per lb. was equal to £2 9s. 6d. The value of the cattle grazing in the first two years, which was estimated at 1s. per head per week, amounted to 15s. 9d., giving a total of £3 5s. 2d. The cost of the basic slag was £1 10s. 0d., which gave a margin of profit of £2 3s. 5d. In the case of slag and kainit, the increase from the unmanured plot was 312 lb., and, at 3s. per lb., this amounted to £3 18s. 0d. Let them add the cattle grazing at the same rate as before, and it came to £2 3s. 6d., giving them a total of £6 1s. 6d. The cost of the manure was £1 18s. 6d., and the profit left was £4 3s. 0d. He thought that was a fairly satisfactory result of an application of manure made six years ago.—*The Scottish Farmer.*

Poultry Hatching and Rearing in Winter.—Ten or a dozen years ago scarcely any farmer ever thought of attempting winter hatching, preferring to wait until the spring and early summer for his first brood. All this is altered nowadays, thanks to the many improvements that have been effected in the construction and management of incubators and brooders, and also to the great reduction in their price that has occurred within the last few years. For nearly every branch of industrial poultry-keeping winter hatching is a great advantage. Whether one is anxious to supply the early spring markets with chickens or ducklings—two of the most profitable branches when the conditions are favourable—or to hatch and rear stock birds for use next season, incubators are necessary, while for nearly every other branch they are, if not absolutely necessary, at all events extremely valuable. A certain amount of prejudice yet exists among farmers against the employment of artificial methods of hatching and rearing, and many still prefer to rely upon hens for incubation. It should be remembered, however, that under these conditions it is quite impossible to participate in the high prices that are obtainable for poultry produce in the early months of the year, since broody hens are exceedingly scarce during the winter. Even when an occasional hen shows a desire to sit she is scarcely to be trusted, for upon the least excuse she forsakes her eggs. If a farmer wishes to hatch his chickens under natural conditions he must make up his mind to obtain only a comparatively poor price for his produce, since his birds cannot be ready for killing

until late in the season, when chickens are plentiful and prices consequently range low. If, on the other hand, he is desirous of making his poultry yield a good return, he must suupply incubators and brooders, for only in this manner is it possible for him to procure a satisfactory price.

It is not everyone who should attempt winter hatching and rearing, for many live amid surroundings that are quite unsuited to the work, and where, if persisted in, artificial hatching and rearing, particularly rearing, are bound to end in failure. If only poultry keepers would study the local conditions before embarking upon a certain branch of the work we should hear much less about failures in the poultry world. Last winter I came across a very striking instance of this. A farmer who was living in a low-lying, damp valley, and whose land consisted of a heavy clay soil, was trying to rear Dorking chickens during December and January. He was experiencing the most appalling ill-luck ; his chickens were dying off very quickly, while the few he did manage to rear were always ailing, they developed slowly, and entailed a tremendous amount of labour. The Dorking, as is well known, cannot thrive on clay soil, nor in a damp situation, and had the farmer taken the trouble to make a few inquiries before starting he would soon have learnt that if he wished to succeed a breed other than the Dorking would have to be chosen. I have often seen turkeys being reared under the most unsuitable conditions, and the blame that was being attached to the birds in particular, and poultry-keeping in general, would have been more suitably bestowed upon the poultry-keeper himself for attempting to rear turkeys under conditions totally unsuited to them. In determining whether to go in for winter hatching and rearing, the situation of the place and the nature of the soil must be taken into consideration, as both these matters have an important bearing upon the results achieved. For winter rearing a heavy soil is not favourable, while there must be a good deal of natural shelter to afford protection from the cold winds and, to a certain extent, from the rain.

One of the reasons why so many farmers are prejudiced against artificial hatching and rearing is that they think the management of an incubator or brooder entails a great amount of labour. It is true, of course, that both require constant care and attention, without which the results are likely to prove very unsatisfactory, but this is a small matter compared with the excellent prices that are secured for winter-hatched chickens. I am not at all sure, however, that artificial hatching and rearing entail any more labour than the natural methods ; as a matter of fact I am inclined to think that

rearing chickens in a brooder is less arduous than under hens. After all is said and done, however, the question of labour is really of small importance in comparison with the many and great benefits derived from the use of an incubator and brooder. Another objection that is constantly being raised against the artificial methods of hatching and rearing is that the chickens hatched in an incubator and reared in a brooder are neither so strong nor so vigorous as those brought out under a hen. This certainly has never been my experience. Provided that reliable machines are employed, and that care and attention are bestowed upon the management, then the chickens are as strong and hardy as those hatched and reared in the natural way. It is also frequently stated that artificially hatched and reared chickens do not attain to the same size as their naturally treated brothers and sisters, but again, so long as the incubator and brooder are reliable, and are carefully tended, this assertion, I think, has no foundation in fact.

So far as incubators and brooders are concerned, it is practically impossible to achieve satisfactory results with poor machines, and it were better to leave this branch entirely alone than to try to succeed under such circumstances. A few years ago the price of an incubator or brooder was almost prohibitive to the ordinary utility poultry keeper, and there was then some excuse for sticking to the old method of hatching and rearing by hens. This is now changed, however, since an excellent incubator or brooder can be procured at a very small cost, in fact, with ordinary luck, it should pay for itself during its first season. At the same time, while price must always be a consideration in favour of an incubator or brooder, reliability and good workmanship must never be sacrificed for the sake of cheapness. This is where the difference lies between economy and false economy.—" E. T. B." in *Farm and Home.*

Making the Best of It.—If farmers were not adepts at " making the best of it," they would often suffer more than they do from fits of depression when Nature frowns upon their efforts. Especially trying are seasons like the past when, after a good seed-time and period of growth, abundant crops were produced only, in many cases, to be ruined at the eleventh hour by persistent rains. But the very nature of his calling and constant association with forces over which he has no control render the farmer strong to bear adversities and disappointments, which come to him through no fault of his own. The harvest has not been uniformly bad, but the total damage to crops must have been enormous, and vast quantities of grain which should have found a remunerative market will have to be consumed

by live stock at home or sold for that purpose. It is a misfortune indeed, but one which leaves room for skill and good judgment to be exercised in the reduction of ultimate loss. The maltster and the miller may refuse to look at damaged samples, but cattle, sheep and pigs will prove good customers, and if judiciously treated will pay a good price, even if they demand a longer credit.

Many will feel inclined to save the cattle bill altogether this winter, but it may not be wise to do so entirely. A little oilcake in a mixed ration may still pay to use. There are plenty of roots, and these, with barley meal and steamed chaff, will make beef as economically as anything, while dairy farmers know that a little barley meal mixed with the oatmeal is a very good auxiliary. For horses the barley should be soaked. The sheep at turnips will dispose of some and the pigs will make good bacon on barley meal—in fact, there is nothing better for them.

Another way of disposing of low-priced corn would be to use some of it in feeding the young cattle in the strawyards better. Here is certain remuneration, for when they are sold for grazing in the spring their value will be much higher. Who does not know how, year after year, the store stock reports in April always read, " Stores in forward condition for finishing at grass sold well " ?

The worst feature, perhaps, in the prospects for winter feeding is the scarcity of good hay, and how to best deal with that stained by rain, or even mouldy, will be a problem to many. Every bit of hay, whether mouldy or not, may be turned to good account by steaming. Where it can be managed there should be a large bin with pipe communicating with the steam-engine. The damaged hay, cut into chaff, placed in this bin and well steamed, loses every trace of mould, and the cattle will eat it as freely as if it had never been rained upon. Where there is a fixed engine the trouble will be very small.

" Making the best of it " is not a bad motto for any farmer, and is applicable to every branch of a farmer's business. The way to " make the best of it " with all live stock may not be easy to ascertain, but I can easily prescribe a sure way " not to do it," namely, by partial fattening. Far better to do it thoroughly, or leave the feeding to someone else and sell as stores. The profit is made by the finisher, and this is the lesson which our graziers are slow to grasp. Grass-fed cattle, as a rule, are sacrificed for want of supplementary food, which would pay for itself twice over, and thousands of cattle come to market which ought to be retained to help make the best of the damaged barley.—Spero in *Live Stock Journal.*

Soya Beans and Cake.—Since the last issue of this Journal Soya Cake has come largely into use as a feeding stuff, and the following extracts may therefore prove of value to those who purpose to try this new material. Mr. Alfred Smetham, the Consulting Chemist to the Royal Lancashire Agricultural Society, in an article on "Some New Feeding Stuffs," published in the Journal of that Society, and since reprinted, writing of the Soya Bean says :

> "As a food for man and for cattle it has been known and largely used in the East, but until recently the importation of the Beans, either in an untreated condition or in the partly manufactured form of oil and feeding cake, into this country has been restricted to experimental shipments, and chiefly to the cake from which the greater part of the oil has been expressed. The samples of the cake which have come under my observation during the past twenty years or so have for the most part been in a more or less mouldy or decomposed condition, and, although the chemical composition compared favourably with other foods upon the market, the physical condition was such that purchasers could not be found for the cake at remunerative rates.
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> "What circumstances or combination of events have made it possible at this particular period for merchants to ship the vast quantities of the Beans which have recently reached these shores I have not been able to discover, but it seems to me that the chief factor is to be found in the development of Manchuria by the Japanese as the result of the Russo-Japanese war. It is said that during the campaign Soya Beans entered largely into the dietary of the Japanese army, and, doubtless, during the progress of the war the Japanese became familiarised with the Bean-producing districts, and the exportation of the surplus supplies is the result. Be that as it may, the fact remains that up to the end of next August, so I am informed on very good authority, the estimated sales in the United Kingdom of the Soya Oil Beans may be roughly estimated at 250,000 tons. What the future is likely to be is uncertain, but from conversations I have had with those who have studied the subject, the general impression seems to be that they "have come to stay," and that, in the near future at all events, the Beans, either whole or crushed into cake, will have to be reckoned with as a serious competitor of the better known and more generally used feeding stuffs.
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> "Although not a general article of commerce in this country, the Soya Bean has for long generations been largely cultivated in China and Japan, and to some extent in India and other

countries in the East, where its intrinsic feeding properties and its value for industrial purposes have long been known and appreciated. The matter has been also carefully investigated from the scientific standpoint and the composition carefully discussed by different authors.

"The most notable fact in connection with the Soya Bean is that, in addition to a high percentage of albuminoids, the beans contain about 17 % of a valuable oil, which, after extraction, is suitable for edible and manufacturing purposes. Already British firms have started the manufacture of Oil and Cake or Meal, and the products are now upon the market at prices which compare very favourably with those produced from other seeds.

"There are varieties of the Soya Bean which differ in colour and appearance, but as will be seen from the following analyses, which are representative of different shipments already imported, the composition is very uniform. For the purposes of comparison I have given at the top of the list the composition of a typical sample of English Beans :—

Composition of Soya Beans.

	Water.	Oil.	Albuminoids.	Carbohydrates.	Woody Fibre.	Ash.	Sand.	"Food Units"
English Beans ..	14.14	1.86	28.12	46.70	6.14	3.04	—	121
Soya Beans ..	12.40	16.93	39.25	19.99	5.83	5.60	1.05	160
,, ,, ..	12.35	17.80	37.50	23.18	4.47	4.70	.40	161
,, ,, ..	11.70	16.73	39.13	20.74	5.70	6.00	1.10	159
,, ,, ..	11.80	17.60	38.13	22.06	5.26	5.15	.55	161
,, ,, ...	12.30	16.57	39.87	19.84	5.62	5.80	.90	161
,, ,, ...	10.85	18.07	38.75	21.11	5.87	5.35	.60	163
,, ,, ...	12.80	17.37	37.37	24.36	3.30	4.80	.35	161
,, ,, ...	12.45	16.93	39.87	19.00	6.55	5.20	.65	161
(Japanese)	11.25	17.47	38.50	22.85	5.28	4.65	.10	162

"From these analyses it will be seen that judged from the composition as interpreted into the equivalent "Food Units," the Soya Beans are of greater value than English Beans by one-third, or expressed in another way, 3 tons of Soya Beans have a feeding value equal to 4 tons of average English Beans.

"But with a very highly concentrated food like Soya Beans, not only must the theoretical food value be taken into account, but the adaptability of the food to the specific purpose for which it is intended must also be considered. In the case of Soya

Beans, the high percentages of oil and albuminoids render the beans too rich to be used in any considerable proportion in a ration for ordinary feeding purposes, and when the beans in a whole condition are used it will be found advantageous, if not absolutely necessary, to use them in conjunction with some food, such as maize, containing a relatively low percentage of oil and albuminoids. What the proper proportion should be will depend upon the general ration and the purpose for which it is intended; but I think it may safely be asserted that to obtain the most satisfactory results the proportion of Soya Beans to the other purchased foods should not exceed one-half of the total, and probably one-third would be a safer quantity to employ. It has been stated that the oil of Soya Beans has a laxative effect upon cattle, but whether it has a greater effect in this respect than a similar quantity of oil derived from such well recognised feeding materials as Linseed and Cotton Seed seems to me open to doubt, but as the percentage in the whole seeds is relatively high it is quite reasonable to believe that when the whole seeds are used the laxative effects complained of are observed.

"Having regard to the relatively high price of Soya Bean Oil (£21 15s. to £22 Naked London) compared with the Soya Oil Beans (£5 18s. 9d. to £6 1s. 3d.), it seems probable, in the light of our present knowledge of the use of an excessive quantity of oil in a ration, that a large proportion of the imported beans will find its way into the hands of cattle food manufacturers, who, either by hydraulic pressure or by solvents, will extract a portion of the oil and sell the residue in the form of Cake or Meal, in which condition it is better suited to general feeding purposes. In general, it may be said that the resultant Cake or Meal will have a feeding value about equal to good Decorticated Cotton Seed Cake or Meal, and I anticipate that, when used in place of the latter and in similar proportions, the Soya Cake or Meal will prove as effective as the Cotton Cake or Meal. As I write, Soya Cake is quoted in London at £6 5s. 0d. to £6 7s. 6d., as compared with Decorticated Cotton Cake in the same market at £7 5s. 0d. to £7 7s. 6d. per ton. If my estimate of the relative use and value of the two foods be correct, it seems to me probable that as the Soya Bean Cake becomes better known to the farming community generally, and, I venture to think, in the not very distant future, the values of the two foods will become closer; but in the meantime, those farmers who have the courage of their convictions, and

who experiment with Soya Bean Cake immediately will, I believe, be amply recompensed.

"The direct shipments of Soya Bean Cake—or, as it has been hitherto more commonly called, China Bean Cake—from the East, have so far been spasmodic and small in extent, and owing to the "heated" condition in which they have arrived, have not been, I should say, a commercial success, on account of the relatively low price realized. The failure in importing the cake in a sound condition is due, I believe, partly to faulty stowage, but more particularly to the shipment of the Cake in too moist a condition. Under improved condition of treatment and transit, I can see no reason why it should not be put on our markets in a sound condition, and I believe that when its value as a food is once demonstrated and generally acknowledged in this country, the foreign-made Cake will, as in the cases of Cakes from Linseed, Cotton, and other Seeds, enter into competition with the home-made article.

"The following analyses may be taken as fairly representative of the Soya Bean Cake recently put upon the market :—

Composition of Soya Bean Cake and Meal.

	Water.	Oil.	Albuminoids.	Carbohydrates.	Woody Fibre.	Ash.	Sand.	"Food Units."
China Bean Cake (Imported) ..	17.00	9.00	40.50	23.78	4.47	5.25	.40	147
Do. Do. Do. ..	17.75	5.00	47.50	18.46	5.49	5.80	.35	150
Soya Bean Meal ..	3.85	11.33	43.25	30.77	5.45	5.35	.25	167
Soya Bean Cake ..	12.70	11.07	38.82	26.51	5.85	5.05	.35	151
Chinese Bean Cake (Rolled)	8.65	17.60	39.00	25.48	4.42	4.85	.15	167
Chinese Bean Cake (Crushed)	9.10	10.23	42.75	27.82	4.90	5.20	.20	160
China Bean Cake (from Southern Ports)	11.65	5.60	46.12	25.46	4.47	6.70	1.20	155
Manchurian Bean Cake	15.60	8.60	41.37	24.81	4.37	5.25	.20	150

Another writer on the same subject, in the December Journal of the Board of Agriculture, says :—

"Up to the present very few experiments on systematic lines have been made with this cake, though it has been extensively used for feeding purposes by farmers.

"One experiment, reported by Professor Gilchrist, of Armstrong College, was carried out at the Cumberland and Westmoreland Farm School, and was intended to test the com-

parative feeding value of soy bean cake and decorticated cotton cake. Three cows and three heifers, after their first calf, were selected in February, 1909. They were all at an early stage of their lactation period, and, as the milk naturally declined in quantity as the trial progressed, it was decided to give soya bean cake during the first and last three weeks, and decorticated cotton cake during the middle six weeks. Each cow received daily 49 lbs. swedes or 42 lbs. mangels, 14 lbs. hay, 7 lbs. oat straw, 4 lbs. crushed oats, and 4 lbs. soy bean cake or 4 lbs. decorticated cotton cake.

"As regards milk production, there was a slight advantage in favour of the soya bean cake, but it was so small that the two cakes were considered to be equal in this respect. Both foods also gave similar results as regards the fat content of the milk. The cows gained rather more in weight while they were receiving the soya bean than they did on the decorticated cotton cake.

"An experiment on similar lines was conducted at the Royal Agricultural College, Cirencester. Six cows were selected from the College herd, and divided into two lots of three each, care being taken that the age, period of lactation, and quantities of milk per day were as nearly equal as possible. The cows were turned out to grass on April 5th, and the experiment lasted from April 12th to May 9th. The daily rations were 35 lbs. pulped mangels, 6-8 lbs. chaff, 2 lbs. ground oats, 1 b. bran, and a small allowance of hay. Lot I. received, in addition, 4 lbs. soya bean cake, and Lot II. 4 lbs. decorticated cotton cake; the bean cake contained 6 per cent. of oil and 40 per cent. of albuminoids, and cost £6 10s. per ton, while the cotton cake contained 8 per cent. of oil and 34 per cent. of albuminoids, and cost £7 10s. 0d. per ton.

"The yield of milk appeared to be little affected by the kind of cake used. The percentage of butter-fat in the case of the bean cake remained almost constant, a slight increase, if anything, being noticed; with the decorticated cotton cake the percentage of butter-fat had a tendency to fall.

"The butter produced by the bean cake was of a soft, oily nature and quickly churned, but it yielded well. It was, however, of a decidedly paler colour and somewhat inferior flavour as compared with that from cotton cake. The butter produced by the decorticated cotton cake was hard and took a longer time to churn. The yield, however, was not so good as from the bean cake. No difference in laxative effect or otherwise was observed in the two cakes.

"Another experiment on a small scale was carried out at the Harper Adams Agricultural College, with two rather delicate heifers, to test the question of the possibility of this cake having any detrimental effect on animals. Increasing quantities up to 7 lbs. a day were given to one animal without any ill-effects, and the cake was eaten with relish. The other heifer was fed on a patent cake, and then a sudden change made to soya bean cake, and in this case also no difference was observed.

"An experiment has been carried out in Germany, in which soya bean cake was compared with linseed cake for feeding cows. The experiment was of a very exhaustive character, but only included three cows, which were fed for a fortnight at a time on linseed cake, soya bean cake, and again on linseed cake. The results showed little difference as the result of the feeding, and the conclusion arrived at was that soya bean cake was a quite satisfactory food for cows.

"Several cases have been reported, we understand, to the Board of Agriculture in which stock fed on soya beans or cake have become ill and died, and an investigation into these cases is now in progress. At present there is no evidence to show that cake made from pure soya beans (*Glycine hispida*), or the beans themselves, if given to animals in suitable quantities, would cause undesirable results. It is possible that the accidents reported have been due to an admixture with the soya beans of some other seed possessing poisonous properties."

Agricultural Education.—A memorandum of the arrangements made between the Board of Agriculture and the Board of Education as to the future development of agricultural education, has recently been issued as a Parliamentary paper. The memorandum is as follows :—

After careful consideration of the many matters and interests involved in the promotion of Agricultural Education, we have decided upon making the various arrangements set out in the following paragraphs as regards the work of the two Boards. Our object has been to provide suitable means for focussing the special needs of agriculture in relation to education, and to secure the practical consideration of the particular problems of this branch of education, and effective co-operation in relation to all educational work carried on for rural areas. These arrangements aim in particular at the improvement and extension of specialised instruction of all grades bearing on agriculture and the maintenance of a close relationship between such instruction and the practice and progress of the various branches of the industry.

(1).—We propose to constitute a Rural Education Conference for the discussion of all questions connected with education in rural districts and for the periodical exchange of views between representative agriculturists and the two Departments. This Conference which will be constituted by a later minute to be issued in the course of the autumn, will consist of members nominated by the County Councils' Association, the Agricultural Education Association, the Royal Agricultural Society of England, and other leading agricultural organisations, together with six additional members to be nominated by the Presidents of the two Boards, so as to provide for the inclusion (*a*) of persons specially competent to deal with educational questions so far as the rural districts are concerned, and (*b*) of representatives of districts not adequately covered by existing agricultural organisations. The Conference will be attended also by such officers of the two Boards as may be nominated by their respective Presidents to take part in its deliberations, and to supply information and to give explanations with regard to any questions that may be raised.

(2).—In order to avoid overlapping or duplication of work in the sphere of Agricultural Education between the Board of Agriculture and the Board of Education, and at the same time to secure that every portion of the field is as largely aided and developed as possible, by the combined and separate efforts of the two Boards, it has been arranged that in future all Parliamentary grants in respect of Agricultural Education shall be distributed, in the case of institutions giving instruction to students taking advanced courses in agriculture or in some special branch thereof as further defined below, by the Board of Agriculture, and as regards other forms of Agricultural Education by the Board of Education. But this distribution will be carried out by both Boards under conditions which will secure that the various sections of work thus aided are in due relation to one another. And, in order to facilitate this, an Inter-Departmental Committee, consisting of responsible officers of the two Boards will be constituted, to consider and report to the Boards on all questions which may arise either as to the correlation of the duties of the two Boards or as to the grants to be made in cases in which they are mutually interested. This committee will meet from time to time as may be required. Officers of either Board, other than those appointed as members of the committee, may assist the committee from time to time, as the committee or either Board may think desirable.

(3).—The sphere of work thus falling to the Board of Agriculture and Fisheries will comprise institutions of two types :—(*a*) Those

whose predominant purpose and work it is to provide comprehensive courses of agricultural instruction of an advanced nature, of which the proper benefits can only be received by students who, on admission, have received a satisfactory general education, whole-time, up to the age of 17 (or thereabouts), or later, or who have otherwise obtained a preliminary education of a similar standard. Each such institution should serve more, usually considerably more, than one Local Education Authority's area. (*b*) Institutions restricted to one special section of agricultural instruction (*e.g.*, forestry, dairying, cider-making), the main purpose of which is to provide a course of specialised teaching in that subject on such a plane as will equip those who pass satisfactorily through it to be competent instructors in that section of agricultural work in agricultural institutions or as local instructors in all parts of the country. Government grants will thus be paid by the Board of Agriculture and Fisheries in respect of their agricultural work to the following institutions, and to such others as may in future be found to be of a similar character or on the same educational plane :—University College of North Wales, Bangor ; University of Leeds ; Armstrong College, Newcastle-on-Tyne ; University College of Wales, Aberyswyth ; University of Cambridge ; University College, Reading ; Royal Agricultural College, Cirencester ; South-Eastern Agricultural College, Wye ; Midland Agricultural and Dairy College ; Harper-Adams Agricultural College ; College of Agriculture and Horticulture, Holmes Chapel ; Harris Institute, Preston ; Royal Veterinary College ; British Dairy Institute, Reading ; Royal Horticultural Society's Garden School, Wisley ; Horticultural College, Swanley ; National Fruit and Cider Institute.

(4).—While the special functions of the Board of Agriculture will, as above shown, be to deal with and to influence the agricultural colleges and other independent institutions named in the foregoing list, the relations of the Board of Education will, in the main, be with the county and other local authorities and such other bodies as are supplying part of the local system of provision of public, including agricultural, instruction. And it will be the business of the inspectors of the Board of Education to represent to the county and other local authorities the need for continuous development of special provision for Agricultural Education, and to draw attention to the various types and grades of work thus required, particularly as regards the need for a largely increased provision of farm schools. The Inter-departmental Committee, with the views of the Rural Education Conference before them, will give to the Board of Education all the advice and information they can as to types of

school, methods of instruction, and lines of organisation of instructional staff, most needing to be encouraged in particular parts of the country.

(5).—There is, at the same time, an important matter in connection with some of the cases comprised in the foregoing paragraph for which some special arrangement seems desirable—viz., the provision and efficient maintenance of farms and experimental stations in connection with farm schools, and such other similar places of agricultural instruction as fall within Section 4 above. These farms and stations are greatly needed if the educational work of institutions of this type is to be carried on with full efficiency; and, as it is in the highest degree desirable that such forms of practical work should be kept in close touch with the latest and best developments in practical agriculture, it is believed that such Government supervision and aid as is made to them should be from the Board of Agriculture. It has, therefore, been arranged that such Parliamentary grants as may be, or become, available for the establishment and maintenance of the farms and stations, or of any experiments or investigations carried on in connection therewith, shall be distributed by the Board of Agriculture: the grant in respect of the educational work of the farm schools being made by the Board of Education, and all necessary arrangements for maintaining due relation between the two functions of the schools and stations, and for making the corresponding grants, being determined by the two Boards on the report of the Inter-Departmental Committee above described.

(6).—We believe that the adoption of the foregoing arrangements will be welcomed by all those who are concerned with the development and extension of existing arrangements for the supply of all grades of education and specialised agricultural instruction in the rural districts. They will afford opportunities for bringing leading and representative agriculturists into touch with the officers of the two Departments and for bringing those officers themselves into closer and more continuous relationship one with the other. It cannot be doubted that much still remains to be done in order to bring the facilities for agricultural education at the disposal of British agriculturists to the level of those enjoyed by many of their competitors elsewhere, and we trust that important advance in this direction may result from the working of the arrangements here described.

Carrington, President of the Board of Agriculture and Fisheries.

Walter Runciman, President of the Board of Education.

22nd September, 1909.

Undesirable Bacteria in the Dairy. — In milk and cheese, the main forms of undesirable bacteria found are those which, while producing acid (some of them abundantly), also produce certain undesirable by-products, such as gases and bad flavours. Such bacteria come mainly from manure and manure-laden dust. This manurial dust falls from the udder and sides of cows during milking ; such bacteria are found on hairs and in the dust of stables, barn-yards, and roads. If cans are not thoroughly cleaned and scalded they will be a source of trouble. Cleanliness of the whey tank, assisted, if necessary, by pasteurisation, will largely remove this source of trouble. A rather common practice, and one which is decidedly objectionable, is that of leaving pails used for the evening milking unwashed and exposed in or near milking places, and thus certain to acquire and retain a dust coating, especially when it is windy, or when exposed to dust raised by animals in passing. The seeding of milk with undesirable bacteria is due generally to lack of cleanliness during milking, or insufficient care of milk and milk utensils. In the dairy, lack of care in one particular may neutralise care in all others. Cleanliness in all particulars—of milkers, of animals, of cans and pails and of milk stools—plus care in cooling, will assure at all times a good wholesome milk. There are several matters connected with our household and dairy work that I would like to refer to more particularly ; these are the common fly and the water supply at farms and factories.

The common fly has always been considered an annoying insect ; but with a better knowledge of its life history, we can add the additional fact that it is at times a disease carrier. The fly commonly breeds in manure, less frequently in decaying food, so that the presence of considerable numbers of flies in a house or factory means always the presence of filth somewhere in the immediate neighbourhood, a condition of affairs which should not exist. Further, the habits of the fly are not of the cleanliest, as most of you are aware. It is not averse to crawling over a mass of filthy excreta, and then trailing over a dish of food or a bald head if either of these are convenient ; or in a factory taking a bath in the milk, etc. Disease producing bacteria have been carried in this way, particularly the bacillus of typhoid fever, and I have traced to flies one serious tainting of cheese in a factory in Northumberland county. As an instance of the numbers of bacteria the common fly will carry, let me quote you the figures given by Prof. Easton, of Cornell University, as they are very interesting. Prof. Easton caught 100 flies in a kitchen, put them in a pint of sterilised water, rinsed them, and then examined the water and found that the number of bacteria on each fly averaged

over 300,000. He next caught a similar number in the cow barn and they averaged over 800,000 each, another hundred in the pig pen, and they averaged over 1,000,000 each, a fourth hundred were caught about the swill pails and they ran up to 1,500,000 bacteria apiece. Do you wonder that some of us object to seeing flies in the milk jug? When one goes into a factory or a house and finds many flies, one is immediately justified in condemning the sanitary surroundings of such premises. In dairies where flies abound it is next to impossible to keep them out of the milk, and the seeding of the milk by the bacteria which they carry must be very appreciable.

The other matter which I desire to mention is that of water at farms and factories. The ideal drinking water of most persons is the clear, colourless, sparkling water of a spring. So strong a hold has this ideal that it is very difficult to convince the average person that water having these characteristics can at times be other than wholesome, and conversely, that water lacking in any of these qualities may be suitable for use. Wells were dug as near the door as possible with a full belief in the purifying properties of mother earth. When the soil was virgin, and when the waste of man, animals, and manufactures was not thrown out on the ground in the neighbourhood of well or stream, then confidence in such water was justified. In other words, so long as the collecting area of the water supply is kept free from waste of human and animal life, so long will a water supply be safe, for as a rule the dissolved mineral and vegetable substances in water are harmless. But we have been exceedingly careless in the disposal of our wastes—the slop water of houses, the drain water of our factories, the excreta of man, and the manure of animals. The result of such carelessness is that very often wells and springs and streams become more or less polluted with these wastes. They may not actually lead to disease production in man or animals; in fact, unless the specific disease agents are present such waters will not carry disease; but they are polluted, and while the polluting material to-day may be quite harmless, to-morrow it may be dangerous. In the same way water may become a dangerous menace to the purity of butter and cheese. Let me point out that in one common type of well—the surface well—the origin of the water is the "ground water," absorbed into the soil and passing downward till held by an impermeable stratum or layer of rock or clay. At times this water is high—that is, the soil has absorbed such quantities that it fills up all the interstices of the soil, as is seen not infrequently in the spring of the year or after very heavy prolonged rains. A well is simply a collecting pit for this water,

which rises and falls with the supply. Ordinarily the more water used from a well the greater will be the drainage area of the well, and in dry seasons a well may be draining the ground water for several hundred feet about it. Now, the water as it passes through the soil carries down with it much of the waste on the surface, at least all the soluble portion and the finer particles such as bacteria. The soil through which such water passes undoubtedly filters this water, but much of the impure material may pass and appear in the well or spring; for springs are simply places where the ground falls away so that the holding layer of rock or hard-pan comes to the surface and the water flows out above it. During 1907 and 1908 I made analyses of 299 samples of well or spring water submitted to me, and of these 175 were contaminated with bacteria of intestinal origin. In other words, they contained bacteria which originated in the intestines of man or animals, hence they would be classed as "unsafe" waters. We have been very careless about the disposal of our wastes—it is time we woke up to the fact that we must provide better drainage about our farm-houses and protect the drainage area of our wells and springs from pollution. This is essential, not only from the health standpoint but from the dairy point of view, because on numerous occasions defects in butter and cheese have been traced to polluted water at dairies and factories. The doctrine of cleanliness, preached for years as essential in the care of milk, should be given a little wider extension, and rid us of our fly pests and of our polluted waters.—Dr. W. M. Connell, in Report of Ontario Dairymen's Association.

Celery in the Field.—Celery is a crop now largely relied on by farmers in the counties of the Fen district, and is increasing in area year by year. As it grows long and bulky it lends itself to railway transit, for it is easy to make up a truckload. Moreover, in autumn and winter it does not become frowsy or stale so rapidly as other vegetables are apt to do.

Celery loves a cool, moist soil. A native of Britain, it is found in its wild state by the sides of wet ditches and in marshy places, especially near the sea. Then it is strong in flavour and poisonous, but by long cultivation it has become one of our most agreeable and popular salads. The consumption in the metropolis through the winter is enormous.

Naturally it is coarse and strong in habit. The edible part is the blanched leaf-stalks, which, when really white, present a pleasing appearance on the table, and lose that bitterness which the unbleached stalk naturally contains. The stalks are used raw as

salads from September till March, also in soups, and are frequently stewed. The points of unblanched leaves are used for flavouring, as are also the seeds ; thus all is brought into use.

The celery is propagated by seed, and early in the new year it is sown in cold frames without artificial heat. These early seedlings are ready to transplant in the field as soon as the outdoor climate is temperate enough for them. They are not delicate, and after a shower soon pick up and lay hold in their fresh settlement.

The most important factor in celery cultivation is the artificial whitening of the leaf-stalks, this part of its production being the most desirable ; but at the same time it is expensive on account of the manual labour required. When celery is required small and tender it ought to be earthed up at an early stage of growth, and the process continued as it advances in height. Where large size is intended, then the earthing may be deferred until further development has taken place. It must be remembered that size is not the only important element—the question is how much of the purchase is edible, as a quantity of unbleached stalk is of small value.

Later sowings take place in March and April, to keep up a succession of crops, for the first sowings are ready for market in September, and the celery is required throughout winter and far into spring. One advantage of early crops is that there is less risk from severe frost, but later sowings must run some risk should a touch of Arctic temperature arrive.

The rows of celery are placed wide apart, say five or six feet. This considerable width between the rows is requisite to allow facilities for banking or landing and to supply the abundance of soil which is needed for the process of bleaching. It is, however, possible to take off another short-lived crop, as lettuce, carrots, radishes, or dwarf beans, between the rows, before the ground is required for the bleaching.—" G." in *Agricultural Gazette.*

Wild Traits in Pigs.—The popular estimate of the character of the domestic pig does not give him a reputation of a particularly savoury nature ; but that this is largely due to carelessness on the part of his master rather than to the innate traits of the animal is apparent if a study is made of the natural habits and peculiarities of the wild species. No animals on the farm used to be more habitually the subject of systematic abuse than pigs, and the wonder is that they managed to survive the treatment to which they were so often compelled to submit. Given any class of sour and decomposing matter to eat, and kept without an attempt at ordinary sanitary conditions in their surroundings, it is hardly to be wondered

at that the creatures are shunned by the average visitor to the farmyard and have a totally unmerited reputation as the perfect image of a "dirty beast," only happy when "wallowing in its own filth." In tropical countries the animal is reputed to be somewhat filthy in its tastes. It is said to be the omnipresent scavenger, and that there is no garbage it will refuse. How far this may be due to starvation is not mentioned.

Fortunately for the pig, his profitable nature and value are compelling farmers to study their own interests by paying greater attention to his requirements; hence it is only among the class of quite small owners that the old-fashioned methods still prevail. It has been found that most, if not all, the ailments to which pig flesh is heir disappear if a reasonable amount of attention is paid to cleanliness, and it is now possible to find herds of a hundred or more healthy animals whose combined sties emit less smell than the one noxious habitation of the cottager's rent-payer.

Pigs are happiest running at large in barton or strawyard, as these conditions most nearly approximate to natural circumstances. They love to rout themselves out deep nests in the straw, in which they will lie half hidden, and a pig possibly feels no discomfort so acutely as a total deprivation of litter in his sty. The trouble pigs take to make their beds is sure testimony to the satisfaction probably derived from comfortable conditions in this respect, and is no doubt a survival of the instinct to make a lair in dry, warm herbage. Sows always bite up their litter in short pieces before farrowing, a habit which, perhaps, ensured the detection and slaughter of snakes and any other deadly creatures which might have been lurking in the vicinity of the lair under natural conditions.

Wild swine choose some deep recess in thick undergrowth for their abode, occupying the lair by day and sallying forth in the evening to more open country in search of food. Being, then, more or less nocturnal by nature, one can understand how it is that pigs are inclined for repose during the daytime, and why exposure to a hot sun deleteriously affects the skin of most sorts, especially of white varieties.

A boar is naturally solitary, associating with the sows for a short time only during the rutting season, which occurs but once a year. Travellers and sportsmen are unanimous in the opinion that a boar is not naturally aggressive if left alone, though he, of course, defends himself savagely if driven to bay. Sows and young pigs, on the other hand, are essentially gregarious, and several litters join company, and live and make excursions together in search of food. The association lasts, indeed, until the young have attained maturity and

their dams are occupied with other litters. The sows are very savage when accompanied by young pigs ; their powers of defence on these occasions are by no means unknown to breeders in this country. It is often unsafe for a stranger to enter the sty of a sow with a young litter, especially if the creature happens to be a pure or cross-bred Tamworth.

The method of turning out large herds of pigs of all ages together, then, is essentially correct, and there can be little doubt that the animals thrive best under these conditions. In a wild state the young pigs seem to be quite untireable, and will follow their trotting dam for miles at a stretch without apparently experiencing the slightest fatigue. There is, therefore, little danger of young pigs being "run off their legs" once they are able to move about at all. Modern breeders are practically unanimous in the opinion that stud boars thrive best when penned up alone, and the prevailing idea seems to be that it is unprofitable policy to run them with sows. As the boar does not, under natural conditions, consort with the sows, the most successful methods of practical management are again based on a natural foundation ; and however much it may be argued that artificial animals require artificial treatment, yet it must not be forgotten that we change only a very few superficial characters under domestication, and the innate traits of a species mostly remain the same and respond best to what one may call the natural methods. A boar soon becomes exhausted from perpetual and promiscuous intercourse with sows, and he retains his vigour and fertility much longer if allowed for the greater part of his time to enjoy a peaceful and solitary existence.

It is admittedly difficult to drive a pig to market—or anywhere else for that matter. No sooner does one endeavour to coerce a member of the porcine race to proceed in a direction in which it does not want to go than, with a grunt and a snort, it breaks back and retires in the opposite direction at a pace which it would hardly get the credit for achieving from anyone who is only acquainted with the animal in its more reposeful moments. As a wild pig is capable of out-distancing the swiftest Indian ponies for a short distance, the animal is evidently speedier than the shortness of its legs would suggest. If not pressed at the start, a hog can, too, keep up the pace and out-distance its pursuers for four, five or even seven miles ; he will, indeed, completely tire out and beat the best horses. The chief difficulty experienced, apparently, when hunting the wild boar in India is in getting it to break cover. Time after time the animal will break back between the beaters, allowing neither man nor obstacle to obstruct its progress, and often severely wounding

anyone who may stand in its way. We can understand, then, something of the instinct which prompts a driven pig to break back; the habit was no doubt an important factor in the past in the preservation of the life of these animals when hunted by four-footed foes or man.

That a pig loves a mud bath no one with experience of these animals can deny; but the trait is frequently misrepresented into a delight in wallowing in filth, which is a somewhat different thing. If a litter of young pigs is turned out within reach of a shallow stream they will spend quite a lot of time in and about the water, and will lie for preference on a muddy bank at the edge, as if this were, in their estimation, the most suitable resting-place to be found. We have seen a sow lying contentedly, half buried by mud, in a wallow of her own construction formed on a marshy bit of ground fed by a small stream, and her satisfied grunts seemed to testify to her thorough enjoyment of the sensation of the water trickling over and around her. Pigs, in fact, habitually find a resting-place in summer in "clean dirt" of a liquid nature (if we may be allowed to apply this description to mud), and coat themselves with it into the bargain wherever possible, which seemingly peculiar habit is no doubt instigated by the character of the skin combined with the natural habitat of the animal. The partially unprotected skin must be particularly tempting to leeches, flies, and other pests which abound in marshy places in tropical countries, and it is probable only by lying in a wallow during the heat of the day, and by securing at the same time a thick coat of mud, that any peace is secured at all. With ears, tail, and neck too short to be of much use as whisks, the only obvious method of defence against insect attacks is to coat the body with some easily-secured natural protective covering.

Curiously enough, elephants have a somewhat similar habit, and for no doubt the same reason. It is said that these animals in captivity cannot be kept healthy unless they are allowed to go daily down to the water's edge, where they first thoroughly syringe themselves and then blow sand on to the wet surface of their backs. We could enumerate other instances to show that wild animals with sparsely-haired skins all seem to have a wallowing or analogous habit; but enough has been said to show that the so-called "filthy" habits of domestic pigs are probably based on a strictly utilitarian foundation, and that it probably adds much to their comfort and happiness if they are allowed in hot weather to indulge a wild trait which still survives even among tame animals.—C. J. Davies in *Live Stock Journal.*

The Broken-Winded Horse.—The dieting and management of the broken-winded horse are matters of great importance, because, cure being impossible, careful attention to these is the only way in which the afflicted animal can be kept working. If they are attended to, the animal, except in severe or advanced cases, can be kept going with comparative comfort to itself and satisfaction to its owner, while their neglect causes misery to both.

Concerning the symptoms of broken wind, little need be said, because a really pronounced case is easily recognised, even by those not particularly well acquainted with equine diseases. It is generally preceded by, and accompanied with, a characteristic cough, a cough which is almost diagnostic. It is long, soft, and wheezy, and once heard is not likely to be forgotten. There is considerable distress manifested on slight exertion, and especially by the animal out of condition or worked on a full stomach. In the stable, especially if the building be close and the air impure, there is exhibited a peculiar double action of the flank in expiration, which rarely fails to attract the attention of even the causal observer. But in spite of the obviously distressed breathing, or difficulty of respiration inseparably associated with broken wind, it is really a dietetic disease. How the impaired digestive function operates in causing respiratory distress need not be considered here, although it is quite susceptible of explanation, and much better understood than the pathology of the disease, concerning which there is some want of agreement, and it will suffice to say that broken wind is invariably due to bad feeding or inferior food, and that eating musty hay has been known to produce it in a few days. Two classes of horses furnish the bulk of the cases—farm horses and greedy ponies—generally the property of owners who are bad feeders. With reference to medicinal treatment, as already hinted, nothing can be expected in the way of cure, except in such cases where from any cause, such as a cold, unfavourable weather, or injudicious feeding, the distressed breathing and cough are aggravated; then it is necessary to resort to medicine, at other times drugs are not of the slightest use. Even where sedatives are employed to give temporary relief when symptoms are pressing, their use should not be persisted in after they have produced the desired effect.

Broken wind being a dietetic disease, or caused by bad or improper feeding, the owner must look mainly to the diet for an amelioration of the distressing symptoms, but there must be skilful management as well.

A first essential is an abundant air space and good ventilation. Broken-winded horses are always worse in damp, "muggy"

weather, and when kept in a crowded stable with other horses. A roomy, cool, airy loose box is the best place for an animal suffering from this infirmity, but it should be bedded with some material the animal will not eat, or measures must be taken to prevent the consumption of straw bedding. To this the broken-winded horse is very prone, and especially when, in the interests of digestion, the allowance of hay has been reduced to vanishing point. The disease is not attended by any loss of appetite; on the contrary, it is invariably marked by a large and often greatly increased appetite and a disposition to drink to excess; and, although bulky, innutritious food has probably caused the complaint, the animal is no more disposed to avoid it than the confirmed dipsomaniac is disposed to eschew whisky—if he can get it.

Very few horses will eat moss litter, although we have known a few with appetites so depraved as to do so, and none will tackle sawdust. One or the other is to be preferred to any of the straws, which are generally greedily consumed, even when badly soiled with dung and urine.

What is wanted is highly nutritious food in small bulk, which in other terms, means that more corn and less hay, or hay and straw chaff, should be given than are usually provided for the class of horse most prone to become broken-winded.

All the food should be of the best quality, and free from must and dust. The farm horse very often becomes broken-winded because compelled to eat damaged hay that is unsaleable in the market. Very little hay should be allowed, and any that is given in its long state should be a prime picked sample, and supplied at night or when the work is done.

The corn should be mixed with only as much chaff as will ensure proper mastication, and the food should all be damped preferably by sprinkling with a weak solution of salt and water.

In feeding, the "little and often" principle should be practised, the daily allowance of food being given in four or five feeds, which necessitates smaller quantities at shorter intervals than the usual three feeds per diem.

The hours of feeding and work should be so arranged that the animal is not called upon to labour on a full stomach. Distress is caused when the distended stomach pressess on the diaphragm and so decreases the size of the chest cavity and lung space. At least an hour should be allowed for stomach digestion and the passing of the food into the intestines.

A supply of clean soft water should be kept within reach of the animal from which it can sip at will. Horses that have water always

in front of them drink less than if it is offered them at stated intervals, especially if the intervening periods are long.

Green food when in season, and carrots in winter, are excellent foods, because laxative and easy of digestion.

Linseed in moderation or small quantities of linseed oil may be usefully given, but linseed in any quantity is incompatible with " hard " condition, and this is the condition in which the broken-winded horse should, as far as possible, be maintained. Some add a little linseed oil to the food, and others wet up the corn and chaff with " cree'd " linseed, or cold boiled linseed tea, but in most cases a weakly mash of bran and linseed, which acts as a laxative, is preferable. Hard corn and regular work—the general management practised in the case of the hunter or racer in training—are best for the broken-winded horse.—" M.R.C.V.S." in *Mark Lane Express.*

The Farmer's Library.

NOTES AND REVIEWS OF NEW BOOKS.

1.—*The Standard Cyclopædia of Modern Agriculture.* London: The Gresham Publishing Co.

In the last issue of this Journal we drew attention to the first two volumes of this publication. Five new volumes which have been brought out during the past twelve months are now before us. These bring the subjects at present treated down to the letter L, and the Cyclopædia will be continued in volumes appearing quarterly. It is a remarkable undertaking, and each volume well maintains the high standard set by the first two. It is clearly printed, and well and amply illustrated, which in our opinion enormously enhances the value of any descriptive work. The simplest illustrations are wood cuts, and mainly instructive; the more elaborate are reproduced photographs, some of which, especially those in colours, are quite works of art. Such, for instance, is the picture, "A Kentish Hop Garden," which forms the frontispiece to Vol. VII. Will such a scene as this some day be a thing of the past? This thought comes into our minds after reading the short notice, to be found in the Note Book of this Journal, on hop-picking by machinery.

It has been said that the farmer needs some knowledge of nearly every known science. To a certain extent this is true, but no farmer can hope to be a botanist, chemist, entomologist, geologist, veterinarian, etc. All he can hope to do is to learn when to call in the help of a specialist with advantage. In order to do this, he should, in addition to a good training, have at his disposal works on all these sciences in so far as they relate to agriculture, to which he could refer when occasion demands. The value of this Cyclopædia depends partly on its being a combination of such text books, each subject being brought up to date by an acknowledged authority. There is the additional advantage that, owing to the alphabetical treatment adopted, one can generally find with rapidity the exact information desired.

A Cyclopædia to be complete should not neglect the smallest matters upon which one might reasonably expect information;

and it should be up to date. We have tested these volumes on both these points and with satisfactory results. It is sometimes urged against a cyclopædia that the information is scrappy, and not sufficiently detailed, that the articles tell you something but never enough. We do not think this fault can be brought against the articles in these volumes. There are undoubtedly certain subjects which cannot be treated briefly, and it will be found that no attempt has been made to do so. Take for example Agricultural Education. We find three distinct articles on the subject, one on Agricultural Education generally, by Professor Somerville; one on Education in Ireland, by Mr. James Wood; and another on Education in Rural Schools, by Mr. J. Cuthbertson. Take yet another illustration of complete rather than scrappy information. The article "Farming," although written by many authors, each taking that part on which he is an authority, occupies no less than 40 pages. In fact, one comes to the conclusion that the authors have been given a fairly free hand and sufficient space to enable them to deal with their subjects thoroughly.

It would be invidious to draw special attention to any of the articles on the score of merit; moreover, in this respect every reader would probably hold a defferent opinion. But to give our readers an idea of the scope of this Cyclopædia we shall refer to some of the articles in each volume.

In Vol. III. we notice an interesting article on Buddeised milk, or in other words, the preservation of milk by means of hydrogen peroxide. This volume, indeed, contains many articles specially relating to milk and milk products, for example, butter and cheese, including both Cheddar and Cheshire cheese-making, most of the dairy articles being written by the pioneer of dairy progress in this country, Professor Sheldon.

In Vol. IV. we come to the letter "D," and some of the articles which have attracted our attention are those on Dairy Appliances and Dairy Bacteriology, both well illustrated, and a remarkable article on Drainage from the pen of Mr. Richard Hendersen.

Passing to the letter "E," we have already drawn attention to the articles on Education. Entomology is another deserving of special notice, both for the matter and the illustrations, and it is sufficient to say that it comes from the pen of Professor Theobald, of Wye College, upon whom the mantle of Miss Ormerod appears to have fallen.

The Fattening of Farm Animals is a contribution which will repay most careful study. It comes from the pen of Dr. C. Crowther, of Leeds, who, if not so well-known as some of the previously

mentioned authors, has evidently made a special study of this subject, and is well acquainted with the work done on the Continent from which most of our knowledge is drawn. A practical Article on Fences deserves mention, and we must draw especial attention to an article on Fertility, by Dr. E. J. Russell. It relates to the fertility of the soil, and is one which deserves to be carefully studied by every farmer who really wants to utilise scientific knowledge in his farming. We have been struck by several articles emanating from the pen of Dr. Russell, but by this one in particular.

In Vol. VI. the two articles which have most impressed themselves upon us are one on grasses, by Professor McAlpine, and one on the Guenon System or Escutcheon Theory, by Mr. Ernest Mathews. Both are well illustrated, and as illustrations of this Escutcheon Theory are essential to its understanding, and also difficult to obtain, this short account will prove of value as well as interest to breeders.

Such is a very brief statement of some of the subjects dealt with in these volumes, while there are many other branches of knowledge adequately treated.

The Editor, Professor R. Patrick Wright, is to be congratulated upon the success, up to the present, of this gigantic undertaking.

2.—*Studies of the Soil.* "*Contributions from the Laboratory of the Rothamsted Experiment Station.*" Cambridge: The University Press.

The Experiment Station at Rothamsted, originally started by Messrs. Lawes and Gilbert, is one of which every English agriculturist is proud. When these great pioneers of agricultural research passed away the experiments were vested in a trust body, who appointed Mr. A. D. Hall as Director to carry on the work of the Station. Mr. Hall recognised that, with the march of agricultural knowledge, other problems needing investigation had arisen besides those which had previously engaged the attention of Messrs. Lawes and Gilbert. More especially was this true of the comparatively new and rapidly growing knowledge that the soil was not merely an inert chemical mass, but the home of myriads of living organisms called bacteria. It had been found that these bacteria were really the chief workers in the soil bring-

ing about those chemical changes on which the plant depended for a supply of food. Thus the decomposition of organic matter, with the final transformation of the nitrogen it contained into nitric acid, was proved to be due to the presence in the soil of bacteria, some of which appeared to decompose the organic substances and convert the nitrogen into ammonia, whilst others took this ammonia and converted it into nitric acid. It was believed that plants obtained the whole of their nitrogen from this nitric acid, but later it was discovered that certain plants were capable of obtaining nitrogen from the air owing to their having bacteria in them which produced nodules on their roots. These were the leguminous plants, such as clover, etc.

Having once determined that the soil contained bacteria, it was but a natural wish to find out how many were present, what varieties were there, and what part these organisms played in the marvellous changes taking place in the soil. Mr. Hall saw the necessity for work of this description being carried out at Rothamsted and thanks to the generosity of Mr. J. F. Mason, a bacteriological laboratory was provided. The Goldsmith's Company made a grant of money, and Mr. Hall obtained the services of Dr. E. J. Russell, Dr. H. B. Hutchinson and others to help in this research work. The result of some of their investigations has recently been communicated to the "Journal of Agricultural Science," and these articles have been reprinted by the Lawes Agricultural Trust. They show what excellent work is being done at Rothamsted, and though some of these articles are too scientific for the general reader, they will gradually influence agricultural theories and, subsequently, practice.

Two of these articles are of such very special interest, that we would draw particular attention to them.

If soil is kept for some time under conditions favourable to the growth of bacteria, we should naturally expect that these organisms would rapidly and continuously increase in number. To a certain extent they do increase, but only slightly, and not continuously, and after a time they seem to reach a maximum. It had been found, however, that if soil were heated to a temperature of boiling water —which would kill all living bacteria but not kill the spores of bacteria—and then this heated soil were kept under similar conditions to the ordinary soil, *i.e.*, conditions favourable to the growth of bacteria—these organisms increased by leaps and bounds, and very soon the heated soil contained more bacteria than the original unheated soil. Drs. Russell and Hutchinson set themselves to discover the explanation of this remarkable phenomenon. It is not

necessary to particularise the elaborate and lengthy experiments which have been made. Suffice it to say they have shown that there is a new fact about soils hitherto undreamt of. They find that the soil contains, besides bacteria, many minute living organisms of a very simple structure, known as Protozoa; of these, perhaps, the best known is the Amœba, a body which, under the microscope, is merely like a tiny speck of jelly constantly, but slowly, changing its shape. It is very similar to a white corpuscle, now often spoken of as a "phagocyte." But small as these amœba are, they are a thousand times as large as the bacteria, and they appear to live partly, at least, by consuming bacteria. There comes a time when the increase of the bacteria in the soil and their consumption by the protozoa seem to balance, and that is why in the ordinary soil the bacteria do not increase beyond a certain number. But when the soil is heated the protozoa are destroyed and subsequently the bacteria are able to grow with impunity and so increase enormously. It is, however, not only heat that will destroy these protozoa, for certain chemical substances possess this power, for example, toluene. If then a soil be treated with toluene, the protozoa destroyed and the toluene then got rid of, the bacteria should subsequently increase far more than in an untreated soil. The following table from Drs. Russell and Hutchinson's work shows what actually was found to happen.

Number of Bacteria in Rich Garden Soil (1 Gram).

Soil.	At beginning.	After 10 days	After 38 days.
Untreated	4,200,000	10,600,000	13,850,000
Treated with Toluene	1,306,000	31,680,000	38,200,000
Heated	40	7,360,000	17,600,000

Thus the authors had explained the problem which they had set out to solve, and which they state as follows :—

> "When soil is partially sterilised, either by heat or by volatile antiseptics, like Carbon Disulphide, Toluene, etc., it becomes more productive and capable of yielding larger crops. The effect of heat was discovered incidentally about 25 years ago by the early soil bacteriologists; the action of carbon disulphide was first noticed somewhat later by a vine grower, who had used it to kill phylloxera. Both cases have since been studied by several investigators, notably Koch and Hiltner and Stormer; a paper was also recently published by one of us

in which it was shown that the property is a general one, holding for all the soils and volatile antiseptics examined and for all the plants, excepting those of the leguminous order. Thus, when a soil had been heated to 95° C. it produced two, three, or sometimes four times as much crop as a portion of the soil which had not been heated, whilst treatment with volatile antiseptics led to an increase in crop varying between 20 and 50 per cent. The treatment had in some way brought about a considerable increase in the amount of plant food—Nitrogen, Phosphorous, and Potassium—obtainable by the plant; even more, indeed, than might be expected from the weight of the crop, since there was an increased percentage of nitrogen and phosphorous in the material of plants grown on the treated soils."

In view of the above facts, may we not ask whether our forefathers were such fools as of recent years we have thought them for paring and burning their fields? And may not the use of a substance like "Vaporite" play a far larger part in the agriculture of the future than we could only a few weeks ago have supposed to be possible?

But we must return to this interesting investigation, for there are still further important results to tell of. Drs. Russell and Hutchinson found that this treatment of the soil with Toluene, or by heat, destroyed the nitrifying bacteria, and that, instead of nitrates being subsequently produced in the soil, it was only ammonia which resulted from the activity of these now numerous bacteria. How came it then that plants should thrive in such a soil, assuming that it did not contain nitrates, which, as we stated at the outset, was considered the only material from which the plant could obtain nitrogen?

This problem would naturally lead to another investigation to determine whether plants can assimilate ammonium salts. Curiously enough, it did nothing of the sort, but quite other results obtained at Rothamsted did lead to such an investigation. The authors say:

"It has recently been shown that the soil of some of the Rothamsted grass plots which have received ammonium salts for many years in succession has become distinctly acid and, that, consequently, nitrifying organisms have become greatly reduced in numbers. Nitrification is limited to portions of soil directly in contact with the few particles of Calcium Carbonate still remaining in the soil. It is evident, therefore, that more or less of the nitrogen assimilated by the grasses must be in a form, or forms, other than nitrate—probably mainly as Ammonium Salt."

The results of this investigation show that :—

> "Agricultural plants of various kinds can produce normal growth when supplied with nitrogen in the form of ammonium salts under conditions which exclude the possibility of nitrification. Some plants grow equally well with ammonium salts or nitrate as source of nitrogen. Other plants, while assimilating ammonical nitrogen in the absence of nitrates, appear to prefer nitrates. It is less certain whether ammonium salts can ever produce better final results than nitrates, although we have indications that this may be the case."

Thus the authors have made clear a remarkable cycle of changes which may, and at times do, take place in the soil.

These investigations redound to the credit not only of their authors, but also of agricultural science in this country, while they will probably have far-reaching effects upon the agricultural practices of the future.

3.—*Woburn Experimental Fruit Farm.* Eleventh Report. By the DUKE OF BEDFORD and S. U. PICKERING. London: The Amalgamated Press, Ltd. 4s. 3d. post free.

We always welcome the appearance of the reports emanating from the experimental Fruit Farm maintained by the Duke of Bedford at Woburn. They are not only interesting, but are of both scientific and practical value. They are probably the best illustration we have in this country of how agricultural research should be carried on, and of how great a value such research may be to the practical man who, while his living depends upon successful culture, is yet not himself in a position to discover what are the conditions of such culture. If your practical man says "Look at the results obtained by so and so without the aid of science," we may reply that it is impossible to be certain that these results were obtained without the aid of science. And even if they were, that is no more argument against the value of science than it would be to say that Mr. Carnegie or any other millionaire made his money without the aid of some knowledge which might have been of value to him. The fact is that with or without the aid of science some few men succeed, while others, and these the vast majority, fail for want of knowledge. The authors of this Report start at once with the following statement :—

"Any attempt to reduce the present Report into the form

of a popular treatise, adapted for the reading of the average fruit grower, would be a failure, for it deals with the nature and action of copper fungicides—a subject which cannot be investigated without dipping somewhat deeply into a number of intricate chemical questions. Beyond expressing the results of our work in as plain a language as possible, no endeavour has been made to disguise this investigation in popular garb; and we hardly think that any apology need be offered to fruit growers on that account; for so much progress has been made of recent years in the views held by them, that there are few now who do not realise that the advancement of their interests depends largely on an increase of knowledge, based often on scientific investigations which they are unable to follow, and that they must content themselves with appreciating the practical outcome of such work, without being able to understand the experiments or the reasoning on which the practical conclusions are founded."

The particulars given show how thorough these experiments have been and the conclusions summarised at the end of the volume, to which the experiments led the authors are of great practical value. From this summary, which may be purchased separately for the small sum of 6½d. post free, we shall make one or two extracts as indicating the value of this Report to the fruit grower. The experiments have largely been on Bordeaux mixture:

"Bordeaux mixture is made by mixing lime with copper sulphate, and a number of different compounds are formed, according to the different proportions taken; the greater the proportion of lime the more will the copper sulphate be, so to speak, destroyed, and the less will be the amount of this sulphate reproduced from it by the action of air, after it has been sprayed on to the trees. To economise material, and at the same time to secure other advantages, as little lime as possible should be used, consistent with throwing down all the copper. The lowest basic sulphate which it is possible to make in this way constitutes what has been called Woburn Bordeaux mixture, and according to its chemical composition it should be 2½ times as efficient as ordinary Bordeaux mixture, when quantities of the two containing the same weight of copper are compared. Direct experiments on the subject have now shown, however, that secondary reactions occur in both cases on exposure of these substances to air, increasing the efficiency of the Woburn Bordeaux and reducing that of ordinary

Bordeaux, so that the relative efficiency of the two, judging by the amount of copper sulphate liberated, is about 20 to 1, instead of $2\frac{1}{2}$ to 1, though for reasons which will be found in the Report, it has been considered advisable to take for practical purposes a lower estimate of the relative efficiency, namely, 12 to 1. This has rendered it possible to place on the market the Woburn Bordeaux mixture—or, rather, another basic sulphate analogous to it—in the form of a paste, at a cost considerably less than that of the copper sulphate alone which a grower would have to use to make Bordeaux mixture of the same efficiency in the ordinary way. This paste simply requires mixing with water at the rate of about 15lbs. to 100 gallons to reproduce a substance which, as regards the copper compound present in it, is absolutely identical with that of a freshly made preparation. Ample evidence on this point is given in the Report.

"The fallacy of the instructions which are habitually given as to the 'proper' way of making Bordeaux mixture, has been demonstrated and it has been shown that direct experiment, as well as the knowledge of the nature of Bordeaux mixture leads to the same conclusion as to the best way of making it so as to get the precipitate in the most bulky condition: namely, that the lime must be as weak as possible, and, therefore, the copper sulphate solution as strong as possible, and that the sulphate should be added to the lime. The lime previously slaked, and made into a milk, should be diluted with the bulk of the water, and allowed to settle for a few minutes; to it should then be added the copper sulphate, previously dissolved in as small a bulk of water as possible; after mixing, excessive stirring or agitation of the mixture should be avoided."

"From what has already been said, it will be evident that the efficiency of a fungicide must not be estimated by the amount of copper contained in it, but by the amount which becomes soluble, and therefore available for the fungicidal action."

"The prevalent idea that the fungicidal action of Bordeaux mixture does not come into play till many days after it has been applied, though in accordance with what, at first sight, would appear to follow from a knowledge of its constitution, has been definitely disproved, and the facts of the case satisfactorily explained. The effects of an application do not become visible at once, because time is necessary for the decay of the tissues."

Finally, we should like to draw special attention to one remark by the authors, for it shows what care and knowledge are really necessary on the part of those who would use the Bordeaux mixture :—

"It is impossible to destroy any fungus without injuring, or risking injury to, the plant which is treated, for both fungus and plant are built up of similar cells, and these are affected alike by the copper."

4.—*Fertilisers and Manures.* By. A. D. HALL, F.R.S. London : John Murray. 5s.

The first question which suggests itself on taking up this book is why and how does the author differentiate between Fertilisers and Manures. He at once answers our question in the introduction as follows :—

"The word 'Manure,' when first met with in English, possessed a much wider significance that it does to-day. Of the same origin as manœuvre, it meant, primarily, to work by hand, and it is used in that sense by Defoe in 'Robinson Crusoe'—'The land which I had manured or dug'; but it also took on the extended meaning of any process or material by which the land could be ameliorated. In the 17th and early 18th centuries this latter sense alone began to prevail; agricultural writers enumerated chalk, lime, marl, burnt clay, etc., as manures, and began to speak of the operations of cultivation as tillages or husbandry, and more recently the tendency has been to restrict the employment of the term even further, confining it to the natural substances possessing a direct fertilising value. Farmyard manure is the typical 'manure'; marl or chalk would no longer be regarded as manure, because they do not feed the plant directly; while substances like Basic Slag or Nitrate of Soda, which simply supply one or other element in the nutrition of a plant, should be termed 'Fertilisers' rather than artificial manures. The distinction is not, however, very clearly drawn, and manure and fertiliser are generally and unconsciously used as interchangeable terms, as indeed they will be in this book."

The author briefly traces the history of the use of Fertilisers and the changes in the views of scientific men relating thereto, which have taken place more especially during the past century. Coming

down to recent days, he draws attention to the enormous amount of food material present in the soil, and to the fact, now generally recognised, that:

> "It is not merely the amount of this or that plant food present in the soil which must be taken into account, but also its mode of combination. The material may be present in the soil and soluble in the acid used for analysis, but yet it may be beyond the reach of the plant in a locked-up or dormant condition. The plant can only obtain substances which have been previously dissolved in the water contained by soils in the field, hence plant food in the soil is only available for the plant in so far as it can pass into solution."

It is owing to the fact that this plant food in the soil is not available that the use of fertilisers is necessary. The author then says:—

> "To judge by field experiments alone there are only three elements required for the nutrition of the crop—nitrogen, phosphorous, and potassium—and this means that soils can usually supply the elements necessary to the plant in sufficient quantities, except in these three cases."

Five very full chapters follow in which Nitrogenous manures, Phosphatic manures, and Potassic manures are respectively dealt with.

Going back, however, to the paragraph last quoted, we find it proceeds as follows:—

> "Fertilisers, then, are designed to supply deficiencies in the soil, and for all practical purposes are to be regarded as consisting of compounds of Nitrogen, Phosphoric Acid, and Potash, either singly, or together. They may also contain Magnesia, Lime or Sulphuric Acid, but these, though equally necessary to the plant, are not counted, since the unaided soil may be trusted to furnish the crop with them."

We cannot altogether agree with the author on this last point. We doubt whether sufficient experiments have yet been made to prove conclusively this assertion. Take, for instance, Sulphuric Acid, which supplies the plant with sulphur, a substance entering largely into many crops. In the analysis of Broadbalk Field, Rothamsted, given by Mr. Hall, we find that the amount of Sulphuric Acid is only one-half the amount of Phosphoric Acid present. Why then should it be taken for granted that it is necessary to apply Phosphoric Acid and not necessary to apply Sulphuric Acid to such a soil? We know of hop soils where an application of compounds containing Sulphuric Acid has been of marked effect, but then,

as is well-known, the hop is peculiar in so far as it probably demands more sulphur than most crops. The author gives no explanation of the well-known beneficial action of Gypsum upon hops, but states :

> "It has been found that it is of beneficial effect upon the soils, where hops also respond to dressings of Potash Salts, and that the result of applications of Gypsum is similar to that of Potash Salts, though to a less degree."

It is not quite certain whether the author here refers to the old experiments of Boussingault, or to more recent work, but the subject is one deserving of careful consideration and also of further investigation. The potash salts applied may have contained sulphates and so supplied the constituent required. In some other respects we think further experiments are most necessary, as regards the influence of manures. Thus of late years, especially in Japan, Manganese has been used as a manure, though probably in England few farmers have ever heard of its being so used. The author says :—

> "Manganese appears also to be a constituent of all plants, and experiments have recently been put forward to show that small quantities of manganese salts have a stimulating effect upon the growth of crops. The experiments are, however, by no means conclusive, and pending further investigations, the use of Manganese Salts cannot be recommended in practice."

But those who know the Japanese will not be at all inclined to believe that they would use this substance without having good grounds for doing so. Is not the author's attitude typical of Englishmen ? We generally wait until someone else has acted as pioneer and then we follow and wonder why we did not take the initiative ourselves.

We have not drawn attention to these details merely to find fault. They afford an indication of how minutely and thoroughly the author has treated his subject, and we may safely say, and gladly recognise, that there is no book on the use of Fertilisers which is more complete, more interesting, or more instructive than this one by the Director of Rothamsted.

5.—*French Market Gardening.* By JOHN WEATHERS. London: John Murray. 3s. 6d.

The prominence which has recently been given to the subject of French Gardening both by advertisement and notices in the public press has probably caused many people to ask—What is French Gardening? It would have been well if the author had, in the first place, explained the meaning of this term and shown how the results were obtained before going into details, for one must read through the greater portion of the book to really get an insight into what French Gardening is. In the main it is simply gardening under glass, not in houses as we cultivate fruit and flowers in England but under frames and what are termed "cloches," or bell glasses, such as are used in England for small aquariums. These are about 17 inches across the mouth and 15 inches in height, and those without knobs on the top are preferred. The author maintains that:—

> "By the use of cloches the gardener is enabled not only to protect tender plants from the cold and wet during the worst period of the year, but, owing to the genial temperature beneath them, he can also raise his plants more quickly than in the open air in the ordinary way. By constant use over the plants, having due regard to ventilation and shading, each cloche serves all the purposes of a miniature forcing house."

Frames are also used as well as cloches.

> "These are made of deal planks about an inch or more in thickness. Those used at the back are generally 9 inches wide, those in the front being an inch or two narrower. Each frame is 13 feet long and 4 feet 5 inches wide, and is built to take three lights; so that two men can easily move a frame from one place to another. The ends of the frames are often made of oak, and the four planks are nailed together, having a stout oak post at each corner. The back posts are 13 or 14 inches long, those in front being 10 or 11 inches, the tops in both cases being flush with the upper edge of the boards. This gives a slope to the frames and not only throws off the rain into the pathways, but also catches the rays of the sun better. Moveable bars connect back and front planks for supporting the lights in the usual way."

A naturally rich, well-manured, and copiously watered soil is necessary for this method of gardening, and last, but not least, indefatigable energy on the part of the gardener. Given these requisites, it is certainly remarkable what can be accomplished by

it. For details of how to obtain the best results, we must refer readers to the book itself. In the first part, they will find a general treatise on the subject, and in the second, instructions for the special culture by this method of no less than 26 varieties of vegetables, etc. Those who are anxious to place upon the market at the earliest possible date, vegetables, which shall compete with those we now import, should certainly invest in this book. According to the author, there is, at the present time, no other book in the English language dealing with all the details of the French system. In this work, " The subject has been considered from a commercial gardener's point of view, the main object being to give reliable information on a subject that is now attracting great attention, not only throughout the British Isles, but in the United States and Canada."

While it is evident that if everyone started market-gardening on this French system, the advantages it offers would soon be lost, yet there is reason to believe that, to a certain extent, it might be most profitably introduced as an adjunct to present methods, and those who are anxious to keep abreast of the times might study the book with advantage.

6.—*Outlines of Bacteriology.* By DAVID ELLIS. London : Longmans, Green and Co. 7s. 6d.

The general reader who takes up this book, if he has not previously studied the subject, will be immensely surprised at the way in which bacteria are now known to affect mankind either for good or ill. It is, indeed, impossible now-a-days to read our newspapers and not find frequent reference to these infinitely minute bodies. So there is a growing demand on the part of men to know something about bacteria, what they are, what they are like, how they grow, and why they have such influence for good or ill. This book is intended to give such information. It is a general exposition of our knowledge rather than a text book, and it does not pretend to be a guide to those who are actually working at the subject. In other words, it is a book for the general reader rather than for the scientist. The author, who is the lecturer in Bacteriology at the West of Scotland Technical College, has not neglected to point out the important part played by bacteria in agriculture.

7.—*Artificial Manures.* By GEORGES VILLE. Translated and Edited by SIR WILLIAM CROOKES. London: Longmans, Green & Co. 10s. 6d.

This work was originally written by the celebrated French chemist, G. Ville, in the year 1876, and the first English edition was published in 1879 and noticed in this Journal. One naturally asks why, after such a lapse of time, it has been deemed necessary to publish a second edition of this work, and for the reply we cannot do better than quote from Sir W. Crookes' introduction to this second edition. He says:—

> "The doctrines advocated in this book, which at the time of its publication were quite new, and appeared to some extent revolutionary, have been vindicated by the experience of agriculturists both in England and France, and for many reasons the issue of a new edition of the work appears desirable. It is only just that its claims to be regarded as a classic, and its author's right to the title of pioneer, should not be forgotten when many of Professor Ville's views are so generally adopted that his prescience and acumen are likely to be underrated and his priority unrecognised."
>
> "Agricultural science has made remarkable progress in the last thirty years, and the altered practice calls for some changes in the text."

Those who can remember the first appearance of this work will not have forgotten the interest which it then aroused. They may, however, have forgotten the contents in detail and will turn again with pleasure to re-read this agricultural "classic," as Sir William Crookes calls it. The younger generation of farmers to whom Ville's book is probably quite unknown, should welcome this new edition which has been so cleverly brought up to date by the joint efforts of Sir William Crookes and Professor Percival. Of the new matter, not the least interesting will be the chapter on "the fixation of the nitrogen of the air for manurial purposes." The book is of special value for those farmers who like to compound the manures they use, and there are some who still like to do this in spite of the fact that it is now possible to obtain any desired mixture from those manufacturers who make a speciality of working to their clients' formulæ. In Ville's time this was not possible, nor was it possible in those days to check the manures which the farmer purchased by submitting them to chemical analysis without materially adding to the cost. Now-a-days the farmer can obtain such analyses from the Official Agricultural Analyst for his county at

quite nominal fees, and if he still continues to be deceived in the quality of the goods he purchases, as unfortunately he even now frequently is, he has no one to blame but himself.

It is impossible for any work on chemical manures not to be a little technical; the subject has to deal with chemical substances, and therefore chemical terms must of necessity be employed. But this book is so written that there is the least possible use of technical terms, and consequently it appeals to the practical farmer in a special manner. As a contribution to the literature of artificial manures, we recommend it to all those who have not previously made its acquaintance; those to whom it is already known need only to be informed of this new and greatly improved edition of an old friend.

8.—*Milk Testing.* By C. W. Tisdale. Northallerton: W. R. Smithson. 1s.

This is a useful little work, concise and well illustrated. It is intended for those practical people to whom accurate tests are of the greatest importance, but who cannot devote much time to them. A certain amount of theory is combined with the practical instruction given, so that one may learn not only how to obtain accurate results, but also what these results signify. Thus the composition of milk is first considered, and then the various methods of testing it, for example, with the Lactometer, for Specific Gravity, with the Creamometer, and then with the more accurate instruments, such as the Gerber tester, which has recently come so much into use. The utility of these tests for farmers is next considered, and then some of the more refined methods of analysis are described, *e.g.*, testing for total solids, the determination of acidity, ascertaining the presence of preservatives and of colouring matter. It is a popular exposition of the kind of testing which can be done by those who are not analytical chemists but yet possess sufficient manipulative skill to handle apparatus, and it should, therefore, be particularly useful to those engaged in the production of milk or its products.

9.—*Farm and Garden Handbooks.* Published by Messrs. W. H. and L. COLLINGRIDGE, London. Price 1s. each, or 1s. 6d. in cloth.

In former issues of the Journal we have referred to some of these well-illustrated, practical little handbooks. Their number has been augmented during the past year by treatises on the goat, sheep, chicken-rearing and incubators, lawns, and "a small holder's guide."

It may be of advantage to our readers to briefly describe the scope and contents of these new handbooks.

The Goat is treated by Mr. J. T. Bird, and in an Introductory notice the Editor of the series says :—

> "Goat keeping is a branch of British husbandry that has made comparatively little progress up to the present time. The fact is, the value of the goat as a milk producer has not been fully, appreciated. Now, however, that small holdings are being widely established throughout the kingdom, it is quite possible that more attention will be paid to the subject.
>
> "The goat has long been known as the poor man's cow, and it certainly ought to be the 'small holder's cow' in districts where it is difficult to get a supply of cow's milk for the requirements of the family."

The Author has divided his subject into three parts; the first relates to breeds, the second to management, and the third to various general topics such as the use of the milk, showing goats, and the care of the animals in health and disease.

Sheep, Their Breeding and Management is from the pen of Mr. James H. Muir, a practical farmer of many years' experience. The volume, which consists of 120 pages, is divided into four parts. The first deals with the all-important question of choosing a breed adapted to the soil of the district. Thus, for generous lowland pastures, quick growing breeds, like the Leicester, Lincoln, and Ryeland, are recommended; while on poor upland pastures the Black-faced Cheviot and Welsh are the more suitable breeds to keep. In the second part, very sound and concise information is lucidly imparted on the selection of ewes and rams, lambing, fattening, washing, clipping, and branding; and in the third part special attention is paid to the various ailments of sheep and the remedies most suitable for combating them. In the last part, the question of green and artificial foods receives consideration. Some useful

data are given about wool and the wool trade, and finally there is a flockmaster's calendar showing beginners in sheep breeding what to do in each month of the year.

Chicken Rearing and the Management of Incubators is written by A. Tysilio Johnson. The subject is of perennial interest, and the work is of such a practical character that any poultry keeper would do well to obtain it. The principal subjects treated are natural incubation, artificial incubation, rearing with hens, artificial rearing, and rearing in winter, and they are particularly well illustrated.

Lawns and Greens. By T. W. Sanders, F.L.S. The difficulty of keeping a lawn in a perfect state is keenly appreciated by all who have tried to do it; in fact, lawns, as a rule, are a source of considerable trouble to amateur gardeners. This very largely arises from want of knowledge, and to those who have such trouble a book of this description will prove invaluable. The work is divided into four parts: the first deals with the formation of lawns, the second with their management, including the operations of mowing, rolling, watering, manuring, weeding, etc., the third with tennis lawns, bowling greens, cricket grounds, etc., and the fourth with the appliances required for the various purposes mentioned in the book. The illustrations are excellent and add greatly to the value of a useful handbook.

The Small Holder's Guide. This is a small work on a large subject. It is, however, not intended as a complete guide, but rather to indicate broadly the lines on which some holdings should be run, while giving information as to where more detailed instruction can be found. It has been written mainly by Mr. E. M. Bear, who, having worked for some years on a fifty-acre holding in a district where similar holdings are numerous, has had exceptional opportunities of learning the needs of small holders. It is edited by Mr. T. W. Sanders, and possesses the characteristics of the other handbooks of this series in being concise, practical, and well illustrated.

Bees for Profit and Pleasure, by H. Gewry; and *Mushrooms and their Cultivation*, by T. W. Sanders, are two further volumes of this series which have come to hand as we are going to press. They appear to possess the same practical advantages which characterise the preceding volumes.

10.—*Stephen's Book of the Farm, Vol III., Farm Live Stock.* London: William Blackwood & Sons.

In the last volume of this Journal we drew attention to the new and fifth edition of this standard work on farming. Stephen's Book of the Farm has always been a favourite, and always will be so long as new editions are brought up to date, and so admirably edited as this is. The present and concluding volume runs to five hundred pages and contains information on all varieties of live stock, their management, their feeding, and their ailments. In addition, it contains nearly sixty fine plates, illustrating the different breeds of live stock now principally engaging the attention of breeders. It is unnecessary to enter into details as to the contents of this book—What is there that it does not treat? We should probably find as much difficulty in discovering this as we should have in attempting to give any idea of its contents. Mr. James Macdonald, the talented Secretary of the Highland Agricultural Society, is to be congratulated on having so well accomplished the task of revising and largely re-writing this work, which is the most complete practical guide to farming in the English language.

11.—*Common Weeds of the Farm and Garden.* By Harold C. Long. London: Smith, Elder & Co. 6s.

The idea, that a volume dealing with weeds and their destruction, and summarising under one cover the information scattered in many volumes published in this and other countries, would be of practical value, was a "happy thought," and the author has now carried that thought into effect, and produced a volume which will certainly be, as he hoped it might be, "useful to all engaged in the various branches of Agriculture." There was room for such a work provided it was not merely a verbal description, but illustrated so as to enable the practical farmer to recognise the various weeds which he met with, for this is the first and essential step towards either their treatment or eradication. The book contains most admirable illustrations of all the most important weeds, and in an Appendix there are illustrations of the principal weed seeds showing their natural size, and their appearance when magnified. After considering the nature of weeds, and showing how they affect crops, the author refers to some of the preventive and remedial measures which

may be taken against them. Then the weeds found in arable land are systematically described. The weeds of grass land are next dealt with and information is given as to the improvement of pastures. Parasitic plants, poisonous plants, and the weeds of ponds, rivers, and ditches duly receive attention, whilst a short chapter shows how seeds are tested and how important this work is. In an Appendix we learn what are the laws in the chief agricultural countries of the world for enforcing the destruction of noxious weeds. In another appendix is a list of the British seedsmen who submit samples to the Zurich Seed Control Station—Why? Because there is no proper seed control station in England. No wonder that the Prince of Wales, after having visited foreign countries, appealed to his future subjects to "wake up."

The author has had considerable help from Professor Percival in the preparation of this useful and timely book, and we strongly recommend our readers to study it.

12.—*The Romance of Modern Chemistry.* By J. C. Philip, D.Sc. London: Seeley & Co., Ltd. 5s.

Speaking recently at a meeting of the Farmers' Club, Professor Wrightson condemned the present system of giving boys intended for farm life a smattering of chemistry, botany, etc. We cannot altogether agree with the Professor in these views. All knowledge must have a beginning, and if a student does not devote sufficient time to his study he will end by having only a smattering of knowledge. But is not that better than none at all? For any farmer to attempt to learn chemistry so as to compete with a chemist in his knowledge would be a ridiculous waste of time. The farmer needs only such an introductory knowledge of chemistry as shall enable him to read intelligently articles written by agricultural chemists for his advantage. Unfortunately modern chemistry is treated in a very dry and uninteresting manner in most books. In years gone by books were written to popularise science, now that it is supposed to be popular, only text-books are written. This work is, however, an exception to the rule; it is written in a popular style, while the high standing of the author ensures the absolute accuracy of its contents. We have enjoyed reading it; we believe most of the members of the Society would do the same, while they

could not help learning from its pages much that would be new and interesting to them. There is a chapter devoted to "Chemistry and Agriculture," and others to "Sugar and Starch," "Fats and Oils," and the "Adulteration of Food," all of which have a more or less special interest to farmers.

13.—*My Garden Diary for* 1910. Published by Messrs. Sutton & Sons, Reading, 1s.

This little work maintains the high position it has attained in the past. It is both useful and artistic for it is produced in a way entitling it to be described as "dainty." The right-hand page gives for each month a space for memoranda, while the left-hand page contains brief but valuable reminders of what ought to be done in the garden during the month. The duties of the kitchen garden take precedence, then follow the operations necessary in the flower garden, and lastly those of the Conservatory. There is a valuable article on the cultivation of Spring flowers from seeds, and lastly useful lists of annuals, etc.

Lawns is another 1s. handbook, issued by the same firm, Messrs. Sutton & Sons, Reading, and may be obtained either from them or from the publishers, Messrs. Simpkin, Marshall & Co., London.

There is no subject connected with lawns, whether they are required merely for ornament or for such practical purposes as tennis, bowling, cricket, etc., which is not briefly considered. Excellent illustrations add to the interest and utility of this work, which is one of the best on the subject.

Bath and West and Southern Counties Society.

EXETER MEETING, 1909.

JUDGES.

HORSES.

Agricultural.—F. W. Griffin, Boro' Fen, Peterborough.

Hunters, Hacks, and Polo and Riding Ponies.—Maxwell Angas, Manor House, Whissendine, Oakham.

Exmoor and Dartmoor Ponies.—G. C. Smyth Richards, Filleigh Lodge, South Molton.

Harness and Jumping.—W. H. Dunn, Wallingtons, Hungerford.

CATTLE.

Devon.—A. Trible, Halson Barton, Holsworthy, Devon.

South Devon.—J. Wood, Bourton, Totnes.

Shorthorn.—W. Crosland, Estate Office, Buscot Park, Faringdon.

Hereford.—A. P. Turner, The Leen, Pembridge, Hereford.

Sussex.—W. Massie, Estate Office, Shillinglee Park, Petworth.

Aberdeen-Angus.—Rev. C. Bolden, Preston Bisset, Buckingham.

Jersey.—E. Mathews, Little Shardeloes, Amersham, Bucks.

Guernsey.—G. T. Barham, Sudbury Park, Wembley, Middlesex.

Kerry and Dexter.—F. N. Webb, Babraham, Cambs.

SHEEP.

Cotswold.—W. Thomas, The Hayes, Sully, Cardiff.

Devon Long Wool.—W. Greenway, Halse, Taunton.

South Devon.—J. M. Peeke, Herndford, Habertonford, Totnes.

Southdown.—H. Padwick, Manor House, Thorney, Emsworth, Hants.

Hampshire Down.—W. T. Hall, Estate Office, Titsey Court, Limpsfield, Surrey.

Shropshire.—W. Barrs, Temple, Measham, Atherstone.

Oxford Down.—J. Bryan, Southleigh, Witney.

Dorset Down.—W. W. Lovelace, Puddle Hinton, Dorchester.

Dorset Horn.—J. H. Chick, Wynford Eagle, Dorchester.

Exmoor Horn.—T. W. Smith, Ford, Eastdown, Barnstaple.

Dartmoor.—W. C. Dawe, Week Farm, Newton Abbot, Tavistock.

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GOATS.

Bryan Hook, Churt, near Farnham.

PIGS.

Berkshire.—J. Lawrence, Stall Pitts Farm, Shrivenham.

Large Black.—W. Townsend, The Manse, Stroud.

Large and Middle White and Tamworth.—Col. F. A. Walker Jones, Manor House, Burton, Westmoreland.

POULTRY.

G. Doble, Bath Road, Bridgwater (Classes 1 to 27 and 56 to 71).

John Frayn, St. Stephen's, Launceston (Classes 1, 28 to 55, and 56 to 71).

PRODUCE.

Cider.—J. H. Hill, New Take, Staverton, Totnes.

Cheese.—F. Meade, The Hill, Langport, Somerset.

Cream Cheese, Butter and Cream.—Prof. Carroll, 1, Rostrevor Terrace, Rathgar, Dublin.

COMPETITIONS.

Butter-Making.—Prof. Carroll, 1, Rostrevor Terrace, Rathgar, Dublin, and B. Read, The Church Farm, Cam, Dursley, Glos.

Milking.—E. J. Dewdney, Chewton Mendip, Bath.

Shoeing.—A. Wheatley, F.R.C.V.S., Reading; and W. H. Bloye, F.R.C.V.S., Plymouth (Devon County Education Committee's Competitions).

Shearing.—C. Norman, Thurloxton, Taunton.

Forestry.—G. Marshall, Estate Office, Godalming.

PRIZE AWARDS, 1909.

*** An animal designated in this list as the "reserve number" is entitled, *conditionally,* to succeed to any prize that may become vacant in its class by reason of the animal placed above it by the Judges failing afterwards to qualify.

† Animals, where not otherwise stated, may be considered to have been bred by the Exhibitor.

Abbreviations explained :—S., sire ; d., dam ; s. d., sire of dam ; y., year ; m., month ; w., week ; d., day ; R., Reserve ; V.H.C., Very Highly Commended ; H.C., Highly Commended ; C., Commended.

HORSES.

FOR AGRICULTURAL PURPOSES.—SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book).

Class 1.—*Shire Stallion, foaled before* 1907. [11 entries.]

I. (**£15.**)—Sir E. Stern, Fan Court, Chertsey, Surrey, black, **Danesfield Stonewall** (23214), foaled 1904, bred by R. W. Hudson, Danesfield, Great Marlow ; s Hendre Hydrometer (18082), d Desford Stewardess (31723), s d Stonewall (15375).

II. (**£10.**)—F. E. Muntz, Umberslade, Hockley Heath, Warwickshire, dark brown, **Dunsmore Hendrick** (26156), foaled 1906, bred by G. Plowright, Hallaton, Uppingham ; s Hendrick (20564), d Dolly (41728), s d Nailstone Adjutant (14750).

III. (**£3.**)—T. Jeffrey, Park Hill Stud Farm, Ipplepen, Newton Abbott, bay, **Rangatira,** foaled 1900, bred by — Hurry, Thorney, Peterborough ; s Southgate Harold (15857), d Happy Girl (16745), s d Fear None (4394).

R.—T. K. Bickell, Hexworthy Barton, Launceston, bay, **Souldern Duke** (21883), foaled 1902, bred by Mrs. Abell, Tooley Park, Hinckley ; s Mere Duke (15235), d Glinton Bonny (32257), s d Thorney Topsman (16425).

H.C.—R. Pocock & Son, Baymead, North Petherton, Bridgwater, bay, **Orfold Conqueror,** foaled, 1906, bred by A. Luckin, Orfold, Billinghurst, Sussex ; s Hendre Champion, d Orfold Bridesmaid, s d Bridegroom William.

Class 2.—*Shire Stallion, foaled in* 1907. [6 entries.]

I. (**£15.**)—M. A. Martinez de Hoz, Berkeley House, Berkeley Square, London, bay, **King's Sort,** bred by Dr. Wall, Hazelwood, Coleshill, Warwickshire ; s Lockinge Forest King (18867), d Hazelwood Rosebud (45202), s d Dunsmore Royal Alderman (17985).

II. (**£10.**)—F. E. Muntz, Umberslade, Hockley Heath, Warwickshire, black, **Orfold Crown King** (26535), bred by W. Heavens, Railway Hotel, South Godstone, Surrey; s Starborough Coronation (21899), d Whitley Quest (43806), s d Worthington Lad (18458).

III. (**£3.**)—Lord Winterstoke, Coombe Lodge, Blagdon, near Bristol, brown, **Rickford Victor Chief**; s Dodford Spark (23245), d Waresley Dona, s d Bury Victor Chief.

R.—P. Coats, Sheepcote, Clifford, Herefordshire, bay, **Clifford Jameson** (26053); s Dunsmore Jameson (17972), d Ransom Gift (46070), s d Calwich Blend (17226).

H.C.—H. Bickell, Parswell, Tavistock, Devon, black, **Savernake Samson,** foaled 3rd June, bred by W. H. Godding, Brimslade, Marlborough; s Savernake Premier (23676), d Savernake Fan (29951), s d Midville Squire (15237).

Class 3.—*Shire Colt, foaled in* 1908. [4 entries.]

I. (**£15.**)—F. E. Muntz, Umberslade, Hockley Heath, Warwickshire, bay, **Umberslade Premier** (Vol. xxxi.), bred by W. Millner, Bridge House, Solihull, near Birmingham; s King Forest (24347), d Woodfield Mabel (43868), s d Pride of Blagdon (6272).

II. (**£10.**)—M. A. Martinez de Hoz, Berkeley House, Berkeley Square, London, brown, **Beachendon Jameson,** bred by W. and J. Flowers, Beachendon, Aylesbury; s Dunsmore Jameson (17972), d Camilla (35293), s d Watnall Merry Lad (16457).

R.—Lord Winterstoke, Coombe Lodge, Blagdon, near Bristol, brown, **Rickford Coming King**; s Ravenspur, d Holker Marionette, s d Prince Harold.

V.H.C.—Hon. L. Greville, Heale House, Woodford, Salisbury, bay, **Heale Violoncello,** foaled 18th May; s Halsted Plantagenet, d Buscot Viola, s d Buscot Harold.

Class 4.—*Shire Mare and Foal, or in-Foal.* [3 entries.]

I. (**£15.**)—F. E. Muntz, Umberslade, Hockley Heath, Wawickshire, bay, **Aldeby Lady Jameson** (46847), foaled 1904, bred by T. J. Cresswell, Ashby Lodge, Thurton, Norwich; s Dunsmore Jameson (17972), d Lady Ingham (32788), s d Boscobel (15002); with foal by King Forest (24347).

II. (**£10.**)—W. and H. Whitley, Primley Farm, Paignton, Devon, grey, **Quality** (46043), foaled 1903, bred by L. Maclean, Newton Longneville, Bletchley, s Dunsmore Jameson (17972), d Withcote Quality 2nd (34517), s d Dunsmore Masterman (12874); with foal by Tatton Friar (21953).

Class 5.—*Shire Filly or Gelding, foaled in* 1906. [2 entries.]

I. (**£10**) and Special*—Sir W. Greenwell, Bart., Marden Park, Woldingham, Surrey, bay filly, **Marden Peach** (54607); s Lockinge Forest King (18867), d Marden Pride (48686), s d Cadnor Harold (17266).

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* Given by the Shire Horse Society, a Gold Medal, value £10, for the best Mare or Filly in the Shire Horse Classes, under Condition 48, and to the Breeder of the winner under the Conditions stated, a prize of £5.

Class 6.—*Shire Filly or Gelding, foaled in* 1907. [2 entries.]

I. (**£10.**)—F. E. Muntz, Umberslade, Hockley Heath, Warwickshire, bay, **Umberslade Pearl** (58637), bred by H. Oakley, Dewstow, near Chepstow; s Dunsmore Jameson (17972), d Birdsall Buttercup (30844), s d Menestrel (14180).

Class 7.—*Shire Filly or Gelding, foaled in* 1908. [6 entries.]

I. (**£10.**)—F. E. Muntz, Umberslade, Hockley Heath, Warwickshire, light bay filly, **Umberslade Queen** (Vol. xxxi.), foaled 5th April; s King Forest (24347), d Aldeby Lady Jameson (46847), s d Dunsmore Jameson (17972).

II. (**£5.**)—M. A. Martinez de Hoz, Berkeley House, Berkeley Square, London, bay filly, **The Girl,** bred by the late — Everard, Bardon Hall, Leicestershire; s The Earl (22856), d Brockham Rose (44378), s d Brisbane (12838).

III.. (**£3.**)—P. Coats, Sheepcote, Clifford, Herefordshire, light bay filly, **Clifford Peach,** bred by J. E. Thurman, Birkholme House, Grantham; s Dunsmore Jameson (17972), d Monk's Mabel (26510), s d Carlton Banker (9017).

R.—C. Hill, Manoravon Farm, Llandilo, Carmarthenshire, South Wales, bay filly, foaled 2nd May, bred by Lord St. David, Lydstep, Penally, Pembrokeshire; s Starborough Chief (21898), d Dowsby Polly (44473), by Dowsby Champion (16645).

HUNTERS.

Class 8.—*Hunter Mare and Foal, or in-Foal.* [8 entries.]

I. (**£15**) **Gold Medal*** and **R.** for Special†—E. W. Robinson, Liscombe, Leighton Buzzard, chestnut, **Golden Leaf,** bred by M. D. Peacock, Middlesham, R.S.O.; s Tertius, d Golden Fringe, s d Discord; with foal by Red Sahib.

II. (**£10.**)—J. Stiles, The Bussells, Huxham, Exeter, Devon, chestnut, **Gold Flake**; d by East Coast; with foal by Rockaway.

III. (**£3.**)—W. and H. Whitley, Primley Farm, Paignton, Devon, black, brown, **Glow-worm,** foaled 1898; s Traverser 2nd, s d Hercules; with foal by Flaxby.

R.—W. and H. Whitley, bay, **Empress 3rd,** foaled 1899, bred by R. H. Roe, Cranoe, Market Harborough; s Barbarian, d Empress 2nd; with foal by Glenrossal.

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* Given by the Hunters' Improvement Society, under Condition 49, a Gold Medal, or £5 and a Bronze Medal, for the best Hunter Brood Mare actually registered or entered in the Hunter Stud Book, in Class 8, not having previously won the Hunters' Improvement Society's Gold Medal as a Brood Mare in 1909, and which must have produced a living foal in 1909, or have her foal at foot. Only Prize winners in the class were eligible for the Medal.

Class 9.—*Hunter Mare or Gelding, foaled before* 1905. [17 entries.]

I. (**£15**) and Special†—T. Tozer, The Barton, Huxham, chestnut gelding, **Grenadier**, foaled 1904, bred by W. Boothman, Miley Hall, Blessington, co. Wicklow; s Red Prince 2nd, d by Marchaway.

II. (**£10.**)—T. L. Bennett, Cross Hands, Chipping Sodbury, chestnut, **The Doctor**, foaled 1904; s d Walmsgate, d Ballynoe.

III. (**£3.**)—T. Tozer, bay gelding, **Sailaway**, foaled 1904; s Whitehall.

V.H.C.—J. H. Stokes, Nether House, Great Bowden, Market Harborough, chestnut gelding, **Arrogant**, foaled 1903; s Alvin.

Class 10.—*Hunter Mare or Gelding, foaled in* 1905. [11 entries.]

I. (**£15.**)—T. L. Bennett, Cross Hands, Chipping Sodbury, chestnut, **The Plover**; s Red Prince 2nd, d Baby, s d Lurgan.

II. (**£10.**)—J. H. Stokes, Nether House, Great Bowden, Market Harborough, bay gelding, **Taffy**; s Wales, s d Fitz-George.

III. (**£3.**)—Lieut.-Col. H. B. Gundry, Grange, Honiton, Devon, bay gelding, **Weymouth 2nd**, foaled 20th April; s Weymouth, d Sylvia.

R.—J. Dearden, West Town House, Brislington, grey mare, **May Girl**, foaled May, bred by W. Doherty, Sheverne, co. Kilkenny; s Thurles, d by Kaffir Chief.

V.H.C.—H. W. Thomas, Castle Green, Taunton, chestnut gelding, **Radium**, s Tramore, d Reliable.

H.C.—E. P. Northey, Higher Bowden, Okehampton, brown gelding, **Bridegroom**, foaled 12th May; s Turgot, d Bounty (2289, Vol. ix., H.I.S.), s d Marmion.

C.—Lieut.-Col. H. B. Gundry, brown filly, **Vera**, foaled 2nd May; s Weymouth, d Carew, s d Prince Craft.

Class 11.—*Hunter Filly or Gelding, foaled in* 1906. [10 entries.]

I. (**£15.**)—T. L. Bennett, Cross Hands, Chipping Sodbury, chestnut gelding, **Sermon**, bred by S. W. Corson, Ballyneety, Ardfinane, co. Tipperary; s Royal Minister, d. K.T.S., s d Hartscown.

II. (**£10.**)—S. Matthews, Grove Park, Modbury, chestnut gelding, **Battleaxe**, foaled 6th April, bred by the late General Jago-Trelawny, Coldrenick, Menheniot, Cornwall; s Battlement.

III. (**£3.**)—J. W. Olver, Westnorth, Duloe, S.O., Cornwall, chestnut gelding, **Battersea**, foaled 4th May; s Battlement, d Polly, s d Perfection.

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† Given by the Hunters' Improvement Society, a Silver Medal or £1 (at the option of the winner), for the best Hunter Mare or Gelding of any age, not having previously won the Society's Silver Medal under this scheme in 1909, bred by a thoroughbred or Registered Hunter Sire out of a registered Mare or a Mare qualified for Registration in the next volume. Only Prize winners in the classes were eligible for the Medal.]

R.—E. P. Northey, Higher Bowden, Okehampton, bay filly, **Destiny,** foaled 17th April; s Turgot, d Dispute.

H.C.—W. Pedrick, Stockland, near Honiton, bay, **Dancing Girl,** foaled 15th May; s Palaver, d Barmaid, s d Fresh Water.

Class 12.—*Hunter Filly or Gelding, foaled in* 1907. [16 entries.]

I. (£10.)—E. W. Robinson, Liscombe, Leighton Buzzard, bay filly, **Easter Egg**; s Riverstown, d Golden Leaf, s d Tertius.

II. (£5.)—T. L. Bennett, Cross Hands, Chipping Sodbury, chestnut gelding, **Teddy,** bred by J. Sweeney, Tourin, Cappoquin, co. Waterford; s Edward, d Baroness, s d Young Speculation.

III. (£3.)—Major-General Jago-Trelawny, Coldrenick, Menhenoit, Cornwall, chestnut filly, **Buttercup,** foaled 21st May; s Battlement, d H.M. (1900 H.S.B.).

R.—R. Hoddinott, Springfield, Gillingham, Dorset, bay gelding, **First Flight,** foaled 28th March, bred by S. Bailey, North End, Frome, Somerset; s Grand National, d Woodlands.

H.C.—Lieut.-Col. H. B. Gundry, Grange, Honiton, Devon, black filly, **Dinah,** foaled 18th June; s Weymouth, d Sylvia.

Class 13.—*Hunter Filly, Colt, or Gelding, foaled in* 1908. [9 entries.]

I. (£10.)—E. W. Robinson, Liscombe, Leighton Buzzard, chestnut filly, **Red Leaf,** foaled 18th March; s Red Sahib, d Golden Leaf, s d Tertius.

II. (£5.)—General Jago-Trelawny, Coldrenick, Menhenoit, Cornwall, bay colt, **Battenberg 2nd,** foaled 27th May; s Battlement, d Duchess of Connaught (527 H.S.B.), s d Connaught.

III. (£3.)—B. Salter, Newlands, Broadclyst, brown filly, **Woodpecker,** foaled 8th May; s Kano, d Lady Ned, s d Master Ned.

R.—Mrs. A. R. Poole, King's Hill, Dursley, chestnut filly, **Patricia,** foaled 17th March; s Battlement, d Pamela, s d Pantomime.

HACKNEYS.

(Registered or eligible for registration in the Hackney Horse Society's Stud Book.)

Class 14.—*Hackney Mare and Foal, or in-Foal. First prize,* £15—*second,* £10—*third,* £3.

[No Entry.]

Class 15.—*Hackney Mare or Gelding, foaled before* 1905. [1 entry.]

I. (£10) and Special*—W. S. Pinsent, Minerva, Newton Abbot, chestnut mare, **Ferniehurst Lady Olivette,** foaled 1902, bred by G. Ellison, Baildon, Yorks; s Royal Danegelt, d Lady Olivia, s d Chocolate Junior.

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* Given by the Hackney Horse Society, a Silver Medal for the best Mare or Filly exhibited in Classes 14 to 18, under Conditions 51.

CLASS 16.—*Hackney Mare or Gelding, foaled in* 1905 *or* 1906. [2 entries.]

I. (**£10.**)—N. DRAY, Normandy House, Whipton, Exeter, chestnut mare, **Ruby,** foaled about 20th May, 1906, bred by A. Steele-Perkins, 20, Sidwell Street, Exeter; s Leyswood Emscote.

R.—W. MORGAN, Station Road, Taunton, chestnut mare, **Lady,** foaled 1906, bred by P. F. Bellow, Tedburn St. Mary; s Leyswood Emscote.

CLASS 17.—*Hackney Filly or Gelding, foaled in* 1907. [2 entries.]

I. (**£10**) and **R.** for Special*—J. MARTIN, Little Marland, Petrockstowe, Dolton, chestnut filly, **Martha,** foaled 25th June; s Target, d Porlock Lass, s d Freshwater.

CLASS 18.—*Hackney Filly, Colt, or Gelding, foaled in* 1908. *First prize,* £10 *second,* £5 *third,* £3.

[NO AWARD.]

PONIES.

(Of the Prizes given in Classes 19 to 26, £12 was contributed by Lord Tredegar.)

CLASS 19.—*Stallion, not exceeding* 14.2 *hands, suitable to get Polo or Riding Ponies.* [3 entries.]

I. (**£6.**) and Special (**b**).—THE KEYNSHAM STUD CO., LTD., Keynsham, near Bristol, chestnut, **White Wings** (P. & R.P.S.B., Sup. 1906, 7 and 8), foaled 22nd June, 1906, bred by The Radnorshire Polo and Riding Pony Co., Ltd., Bleddfa, Llangunllo, R.S.O., Radnorshire; s White Mask (190), d First Flight (615), s d Balquihidar.

II. (**£4**) and **R.** for Special (**b**).—SIR J. BARKER, Bart., M.P., The Grange, Bishops Stortford, Herts, bay, **Othrae,** foaled 1905, bred by W. E. Elsey; s Raeburn, d Othery, s d King Monmouth.

R.—MISS K. P. TYRRELL, Ivy Cot, Sidmouth, Devon, bay, **Rosicrucian** (369), foaled 12th May, 1901; s Rosewater (37) d Mavourneen (732), s d Edward the Confessor (Vol. xv., p. 378).

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* Given by the Hackney Horse Society, a Silver Medal for the best Mare or Filly exhibited in Classes 14 to 18, under Conditions 51.

(*b*) Given by the Polo and Riding Pony Society, subject to Conditions No. 53, a Silver Medal for the best Polo Pony Stallion, registered or eligible for registration in the Stud Book; or best Polo Pony Entire Colt, one, two, or three years old, entered or eligible for the Supplement.

CLASS 20.—*Mare, not exceeding* 14.2 *hands, suitable to breed Polo or Riding Ponies, in-Foal, or with Foal at foot.* [5 entries.]

I. (**£6**) and Special (**a**).—SIR J. BARKER, Bart., M.P., The Grange, Bishops Stortford, Herts, bay, **Sapphire,** aged, bred by J. Curry, Dowdenstowne, Ballymore, Eustace, co. Kildare ; s Pet Fox, d Lurgan ; in foal to Sandiway.

II. (**£4**) and **R.** for Special (**a**).—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, brown, **Cobweb,** bred by — Blight, Modbury ; s Dry Toast, d Spider ; with foal by Cruickshanks.

R. and Special (**d**).—THE KEYNSHAM STUD CO., LTD., Keynsham, near Bristol, dark chestnut, **Ohmy 2nd** (1000), foaled 13th March, 1900 ; s Mootrub (32), d Ohmy (425), s d Belgrave ; with foal by Gownboy (114).

CLASS 21.—*Exmoor Mare, foaled before* 1905, *not exceeding* 12.2 *hands, in-foal or with foal at foot.* [2 entries.]

I. (**£6.**)—SIR C. T. DYKE-ACLAND, Bart., Killerton, Exeter, dark bay, **Ashway No. 1,** foaled end of May or beginning of June, 1902 ; s Dunkery ; in foal to Minister.

R.—SIR C. T. DYKE-ACLAND, Bart., bay, **Ashway No. 2,** foaled end of May or beginning of June, 1902 ; with foal by Tan Steps.

CLASS 22.—*Exmoor Mare or Gelding, for riding purposes, foaled before* 1905, *not exceeding* 12.2 *hands.* [4 entries.]

I. (**£6.**)—SIR C. T. DYKE-ACLAND, Bart., Killerton, Exeter, bay gelding, **Punch,** foaled 1904.

II. (**£4.**)—H. W. GOULD, Compass Cottage, Stoke Hill, Exeter, bay gelding, **Jack,** aged 9 years.

R.—C. NEWCOMBE, Klondyke, Okehampton, brown gelding, **Laddie,** foaled 20th September, 1903 ; s Cannon Ball, d Midget.

CLASS 23.—*Dartmoor Mare, foaled before* 1905, *not exceeding* 13 *hands, in-foal, or with foal at foot.* [1 entry.]

I. (**£6.**)—THE KEYNSHAM STUD CO., LTD., Keynsham, near Bristol, brown, **Little Wonder** (1250) (late **Dainty**), foaled 1895, bred by F. Norrish, Spitchweek Lodge, Ashburton, Devon ; with foal by Gownboy (114).

(a) Given by the Polo and Riding Pony Society, subject to Conditions No. 53, a Silver Medal for the best Polo Pony Brood Mare, registered or eligible for registration in the Stud Book.

(*d*) Given by the Polo and Riding Pony Society, subject to Conditions No. 53, a Bronze Medal for the best Foal, entered or eligible for the Supplement.

CLASS 24.—*Dartmoor Mare or Gelding, for riding purposes, foaled before* 1905, *not exceeding* 13 *hands.* [4 entries.]

I. (**£6.**)—THE KEYNSHAM STUD CO., LTD., Keynsham, near Bristol, brown, **Little Wonder** (1250) (late **Dainty**), foaled 1895, bred by F. Norrish, Spitchweek Lodge, Ashburton, Devon ; with foal by Gownboy (114).

II. (**£4.**)—U. ALLEN, Bend Or House, Exeter, bay gelding, **Joey,** foaled 1904.

R.—W. H. PRISTON, Sydney House, Alphington Road, Exeter, grey mare, **Miss Edith,** foaled 3rd May, 1903.

CLASS 25.—*Filly, Colt, or Gelding, foaled in* 1906, *not exceeding* 14.2 *hands.* [5 entries.]

I. (**£6.**)—THE KEYNSHAM STUD CO., LTD., Keynsham, near Bristol, chestnut **White Wings** (P. & R.P.S.B., Sup. 1906, 7, and 8), foaled 22nd June, 1906, bred by The Radnorshire Polo and Riding Pony Co., Ltd., Bleddfa, Llangunllo, R.S.O., Radnorshire ; s White Mask (190), d First Flight (615), s d Balquhidar.

II. (**£4**) and Special (**c**).—SIR J. BARKER, Bart., M.P., The Grange, Bishops Stortford, Herts, bay filly, **Florentine** ; s Sandiway (121), d Florence.

R.—MISS CALMADY-HAMLYN, Bidlake Vean, Bridestowe, Devon, grey, **Cherry Blossom** (P. & R.P.S.B. Sup.), foaled 14th March, bred by A. R. Bray, Station Road, Okehampton ; s Turgot T.B., d Morella (1423 P. & R.P.S.B.).

CLASS 26.—*Filly, Colt, or Gelding, foaled in* 1907, *not exceeding* 14.0 *hands.* [4 entries.]

I. (**£6**) and **R.** for Special (**c**).—SIR J. BARKER, Bart., M.P., The Grange, Bishops Stortford, Herts, brown filly, **Tith** ; s Right For'ard, d Tita.

II. (**£4.**)—MISS CALMADY-HAMLYN, Bidlake Vean, Bridestowe, Devon, chestnut filly, **Lavender Water,** foaled 18th July, bred by — Wood, Chillaton, Devon ; s Newmarket (T.B.), s d Freshwater (T.B.).

R.—SIR J. BARKER, Bart., M.P., brown filly, **Mavourneen,** aged 2 years ; s Right For'ard, d Kathleen.

(*c*) Given by the Polo and Riding Pony Society, subject to Conditions No. 53, a Silver Medal for the best Polo and Riding Pony, not exceeding 14.2 hands, with Hurlingham certificate or confirmed by that of a qualified Veterinary Surgeon, owned by a member of the Polo and Riding Pony Society.

HARNESS AND JUMPING CLASSES.

HARNESS.

CLASS 27.—*Mare or Gelding, not over* 14.2 *hands, driven in harness on the first day of the Show.* [8 entries.]

I. (**£10.**)—L. SMITH, Woodhouse, Stroud, Gloucestershire, chestnut, **Connaught King.**

II. (**£5.**)—MISS G. BURSTON, Fitzroy, Taunton, bay gelding, **Action Again.**

III. (**£2**) and **R.** for Special*—L. SMITH, chestnut gelding, **Mel Valley's Perfect Wonder,** foaled 1902, bred by A. S. Day, Berkeley Towers, near Crewe ; s Lord Hamlet, d Peggy Sure Four, s d Dane Royal.

R.—F. H. CORNELIUS, Temperance Hotel, Chard, bay, **Perfection.**

H.C.—F. COLE, Sprecombe, Braunton, North Devon, bay, **Moonhill Mimic,** foaled 28th April, 1904, bred by W. Lloyd, Moonhill, Cuckfield, Sussex ; s Heath Hamlet (H.S.B.), d Heath Heroine, s d Goldfinder 6th.

CLASS 28.—*Tandems* (*Mares or Geldings*), *driven in harness on the first day of the Show.* [4 entries.]

I. (**£10.**)—L. SMITH, Woodhouse, Stroud, Gloucestershire, chestnut gelding, **Polonius.**

II. (**£5.**)—BUTCHER AND WEIGHT, St. George, Bristol, chestnut, **Emlyn Cæsar,** 6y ; and brown mare, **Lady Gordon,** 5y.

CLASS 29.—*Mare or Gelding,* 15 *hands or over, driven in harness on the second day of the Show.* [6 entries.]

I. (**£10.**)—MISS G. BURSTON, Fitzroy, Taunton, chestnut gelding, **Heathfield Squire.**

II. (**£5**) and Special*—W. S. PINSENT, Minerva, Newton Abbot, chestnut mare, **Ferniehurst Lady Olivette,** foaled 1902, bred by G. Ellison, Baildon, Yorks ; s Royal Danegelt, d Lady Olivia, s d Chocolate Junior.

III. (**£2.**)—R. I. WEIGHT, St. George, Bristol, chestnut, **Emlyn Cæsar,** 6y.

R.—E. JONES, Manoravon, Llandilo, gelding, **Towyvale Swell,** 7y ; s Yorkshire Post, d Dear Nell, s d Goldfinder.

C.—H. BANFIELD, Honiton, red roan gelding, **Silver King,** foaled 1904, bred by S. Durbin, Farwood Barton, Northleigh, Honiton.

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* Given by the Hackney Horse Society, a Prize of £5 or a Gold Medal for the best Mare or Gelding exhibited in Single Harness in Classes 27 to 36, subject to Condition 52.

CLASS 30.—*Pair of Carriage Horses (Mares or Geldings), driven in double harness on the second day of the Show.* [4 entries.]

I. (**£10.**)—L. SMITH, Woodhouse, Stroud, Gloucestershire, chestnut, **Connaught King** and chestnut gelding, **Polonius.**

II. (**£5.**)—MISS G. BURSTON, Fitzroy, Taunton, bay gelding, **Norbury Royalist,** and chestnut gelding, **Heathfield Squire.**

R.—BUTCHER AND WEIGHT, St. George, Bristol, chestnut, **Emlyn Cæsar,** 6y; and brown mare, **Lady Gordon,** 5y.

CLASS 31.—*Mare or Gelding, over* 14.2 *and under* 15 *hands, driven in harness on the third day of the Show.* [4 entries.]

I. (**£10.**)—L. SMITH, Woodhouse, Stroud, Gloucestershire, chestnut gelding, **Polonius.**

II. (**£5.**)—BUTCHER AND WEIGHT, St. George, Bristol, brown mare, **Lady Gordon,** 5y.

R.—E. JONES, Manoravon, Llandilo, mare, **Towyvale Lady Pem,** 5y, bred by J. Howell, St. Fagan's; s Athil.

CLASS 32.—*Trotting. Best Mare, Stallion or Gelding, under* 15 *hands, for speed and action, driven in harness on the third day of the Show.* [2 entries.]

I. (**£10.**)—L. SMITH, Woodhouse, Stroud, Gloucestershire, chestnut gelding, **Polonius.**

R.—BUTCHER AND WEIGHT, St. George, Bristol, brown mare, **Lady Gordon,** 5y.

CLASS 33.—*Mare or Gelding, not over* 13.2 *hands, driven in harness on the fourth day of the Show.* [5 entries.]

I. (**£10.**)—L. SMITH, Woodhouse, Stroud, Gloucestershire, chestnut gelding, **Mel Valley's Perfect Wonder,** foaled 1902, bred by A. S. Day, Berkeley Towers, near Crewe; s Lord Hamlet, d Peggy Sure Four, s d Dane Royal.

II. (**£5.**)—W. MORGAN, Station Road, Taunton, blue roan, **Princess May,** foaled 1902, bred by Wilmot Bros., Thornbury, Gloucestershire.

R.—MISS G. BURSTON, Fitzroy, Taunton, bay gelding, **Mel Valley Spring Chicken.**

CLASS 34.—*Trotting. Best Mare, Stallion, or Gelding,* 15 *hands or over, for speed and action, driven in harness on the fourth day of the Show.* [3 entries.]

I. (**£10.**)—R. I. WEIGHT, St. George, Bristol, chestnut, **Emlyn Cæsar,** 6y.

II. (**£5.**)—H. BANFIELD, Honiton, red roan gelding, **Silver King,** foaled 1904, bred by S. Durbin, Farwood Barton, Northleigh, Honiton.

R.—MISS L. MARTYN, Inchcoulter, Exmouth, chestnut mare, **Lady R,** foaled 22nd June, 1898, bred by J. Breedon, Hucknall, Notts; s King Merry Legs, d Polly, s d Cabbage Sprout.

CLASS 35.—*Mare or Gelding, under* 15 *hands, driven in harness on the fifth day of the Show.* [3 entries.]

I. (**£10.**)—BUTCHER AND WEIGHT, St. George, Bristol, brown mare, **Lady Gordon**, 5y.

II. (**£5.**)—L. SMITH, Woodhouse, Stroud, Gloucestershire, chestnut gelding, **Mel Valley's Perfect Wonder**, foaled 1902, bred by A. S. Day, Berkeley Towers, near Crewe; s Lord Hamlet, d Peggy Sure Four, s d Dane Royal.

R.—J. A. COLLINGS & SONS, Jobmasters, Exeter, bay gelding, **Nabob.**

CLASS 36.—*Mare or Gelding, the bona fide property of a Tradesman of the City of Exeter, to have been owned and used by him for two months previous to the opening of the Show, on his daily rounds for business purposes, exhibited in the cart and harness in which it was regularly driven, on the fifth day of the Show.* [9 entries.]

I. (**£5.**)—EASTMAN'S, LTD., 5, Bedford Street, Exeter, dark bay mare, **Kitty**, foaled 20th May, 1900.

II. (**£3.**)—EXETER BRICK AND TILE CO., LTD., Exeter, chestnut, **Rock.**

III. (**£2.**)—UNITED YEAST CO., LTD., 16, South Street, Exeter.

R.—A. W. BOON, 5, Eastgate, Exeter, black mare, **Nell**, foaled March, 1903.

C.—A. S. HAVILL, 5, High Street, Exeter, grey, 5y, bred by — Stanbury, Tedburn St. Mary.—W. R. WESTERN, 9, Goldsmith Street, Exeter, chestnut mare, **Daisy**, bred by G. B. Tattershall, Heathfield House, Woodbury; s Norfolk Swell.

JUMPING.

CLASS 37.—*Mare or Gelding,* 15 *hands and over, jumping in the best form on the first day of the Show.* [9 entries.]

I. (**£10.**)—T. GLENCROSS, Garth, Frome, Somerset, bay mare, **Blink Bonny.**

II. (**£5.**)—W. SINGER, Woodcock Farm, Frome, chestnut, **Compton Bassett.**

III. (**£2.**)—J. GLENCROSS, North End Stables, Frome, bay, **Nomination.**

R.—J. W. B. Syers, Holyrood House, Chard, brown gelding, **Arthur**, foaled 1903; s Butterscotch.

CLASS 38.—*Mare or Gelding, under* 15 *hands, jumping in the best form on the first day of the Show.* [4 entries.]

I. (**£10.**)—J. W. B. SYERS, Holyrood House, Chard, brown gelding, **Jonathan**; s The Squire.

II. (**£5.**)—J. W. B. SYERS, bay mare, **Mystery**, foaled 1901; s Exchange.

CLASS 39.—*Mare or Gelding,* 15.3 *hands and over, jumping in the best form on the second day of the Show.* [4 entries.]

I. (**£10.**)—T. SINGER, High House Farm, Corsley, Warminster, bay, **Novice.**

II. (**£5.**)—J. W. B. SYERS, Holyrood House, Chard, brown gelding, **Arthur,** foaled 1903 ; s Butterscotch.

R.—J. W. B. SYERS, chestnut gelding, **Chance It,** foaled 1904 ; s Narrator.

CLASS 40.—*Mare or Gelding, under* 15.3 *hands, jumping in the best form on the second day of the Show.* [7 entries.]

I. (**£10.**)—J. GLENCROSS, North End Stables, Frome, bay, **Nomination.**

II. (**£5.**)—J. GLENCROSS, bay, **Kitty.**

III. (**£2.**)—W. SINGER, Woodcock Farm, Frome, chestnut, **Compton Bassett.**

R.—J. W. B. SYERS, Holyrood House, Chard, brown gelding, **Jonathan** ; s The Squire.

CLASS 41.—*Mare or Gelding,* 15 *hands and over, jumping in the best form, on the third day of the Show.* [9 entries.]

I. (**£10.**)—MRS. W. PEDRICK, Church Style, Stockland, near Honiton, bay gelding, **Monkey.**

II. (**£5.**)—T. GLENCROSS, Garth, Frome, Somerset, bay mare, **Blink Bonny.**

III. (**£2.**)—W. SINGER, Woodcock Farm, Frome, chestnut, **Compton Bassett.**

R.—J. W. B. SYERS, Holyrood House, Chard, brown gelding, **Arthur,** foaled 1903 ; s Butterscotch.

CLASS 42.—*Mare or Gelding, under* 15 *hands, jumping in the best form on the third day of the Show.* [4 entries.]

I. (**£10.**)—J. GLENCROSS, North End Stables, Frome, bay, **Kitty.**

II. (**£5.**)—J. W. B. SYERS, Holyrood House, Chard, brown gelding, **Jonathan** ; s The Squire.

R.—J. W. B. SYERS, bay mare, **Mystery,** foaled 1901 ; s Exchange.

CLASS 43.—*Mare or Gelding,* 15.3 *hands and over, jumping in the best form on the fourth day of the Show.* [4 entries.]

I. (**£10.**)—J. W. B. SYERS, Holyrood House, Chard, chestnut gelding, **Chance It,** foaled 1904 ; s Narrator.

II. (**£5.**)—J. W. B. SYERS, brown gelding, **Arthur,** foaled 1903 ; s Butterscotch.

R.—T. SINGER, High House Farm, Corsley, Warminster, bay, **Novice.**

Class 44.—*Mare or Gelding, under* 15.3 *hands, jumping in the best form on the fourth day of the Show.* [8 entries.]

I. (**£10.**)—W. Singer, Woodcock Farm, Frome, chestnut, **Compton Bassett.**

II. (**£5.**)—Mrs. W. Pedrick, Church Style, Stockland, near Honiton, bay gelding, **Monkey.**

III. (**£2.**)—J. W. B. Syers, Holyrood House, Chard, bay mare, **Mystery,** foaled 1901; s Exchange.

R.—J. W. B. Syers, brown gelding. **Jonathan**; s The Squire.

Class 45.—*Mare or Gelding,* 15 *hands and over, jumping in the best form on the fifth day of the Show.* [6 entries.]

I. (**£10.**)—Lieut.-Col. Hobart, West Cliff Hall, Hythe, Southampton, bay mare, **Hettie,** foaled 1903, bred by S. Bailie, M.R.C.V.S., Dublin; s Topsawyer, d Ginfly, s d Bird of Freedom.

II. (**£5.**)—J. W. B. Syers, Holyrood House, Chard, chestnut gelding, **Chance It,** foaled 1904; s Narrator.

III. (**£2.**)—Mrs. W. Pedrick, Church Style, Stockland, near Honiton, bay gelding, **Monkey.**

Class 46.—*Mare or Gelding, under* 15 *hands, jumping in the best form on the fifth day of the Show.* [2 entries.]

I. (**£10.**)—J. W. B. Syers, Holyrood House, Chard, bay mare, **Mystery,** foaled 1901; s Exchange.

R.—C. G. R. Weller, Easthayes, Ottery St. Mary, Devon, bay, **Rex.**

Extra Class.—*Mare or Gelding, any height, jumping in the best form on the fifth day of the Show.*

I. (**£5.**)—J. W. B. Syers, Holyrood House, Chard, chestnut gelding, **Chance It.**

II. (**£2.**)—J. W. B. Syers, bay mare, **Mystery.**

III. (**£1.**)—Mrs. W. Pedrick, Church Style, Stockland, near Honiton, bay gelding, **Monkey.**

R.—Lieut.-Col. Hobart, Westcliff Hall, Hythe, Southampton, bay mare, **Hettie.**

CATTLE.

£100 towards the Prizes in the South Devon Cattle and South Devon, Dartmoor and Exmoor Sheep Classes was contributed by the Devon County Agricultural Association.

DEVON.

CLASS 47.—*Devon Cow, in-Milk, calved before* 1906. [7 entries.]

I. (£10.)—THE HON. E. W. B. PORTMAN, Hestercombe, Taunton, **Bearwood Flirt** (19165), born 24th July, 1902, bred by Colonel A. F. Walter, Bearwood, Wokingham ; s Lord Pitsworthy (4440), d Beauty 3rd (17693), s d Rent Day (3799).

II. (£5.)—THE HON. E. W. B. PORTMAN, **Welcome** (21140), born 6th April, 1903, bred by E. Badcock, Dunster, Taunton, Somerset ; s Duke of Wellington (4184), d Wellbred, s d Rent Day (3649).

III. (£2.)—W. LETHBRIDGE, Home Farm, Wood, Okehampton, **Lovely 39th,** born 6th January, 1904, bred by W. Lutley, Escott, Carhampton, Taunton ; s Apollo (4700), d Lovely 18th (11543), s d Lord Escott 2nd (2436).

R. & H.C.—LORAM BROTHERS, Rosamondford, Aylesbeare, Exeter, **First Flight** (18628), born 2nd August, 1902, bred by W. H. Bond, Tyneham, Wareham, Dorset ; s Pom Pom (4464), d Capton Furzebloom (17384), s d Sir Thomas (4109).

C.—LORAM BROTHERS, **Chilfrome Prim 9th** (19411), born 16th March, 1903, bred by J. T. Ensor, Hill Butts Farm, Wimborne ; s Prince of Roses (4275), d Chilfrome Prim 4th (14141), s d Moderator (3487).

CLASS 48.—*Devon Heifer, in-Milk, calved in* 1906. [3 entries.]

I. (£10.)—THE HON. E. W. B. PORTMAN, Hestercombe, Taunton, **Lady Coot** (21647), born 27th March, bred by the late G. Risdon ; s Crusader (4954), d Lovely 34th (18335), s d Lord Escott 5th (4437).

II. (£5.)—T. S. MORGAN, Whimple, Exeter, Devon, **Whimple Beauty 10th** (21511), born 7th May ; s Pound Mayor (4850), d Whimple Beauty 2nd (18965), s d Dodington Hero (4177).

R.—THE LORD CLINTON, Heanton Satchville, near Dolton, North Devon, **Coronation 15th,** born 25th February ; s Pound Curly's Duke 3rd (5084), d Carnation 12th (19346), s d Welcome Boy (4508).

CLASS 49.—*Devon Heifer, calved in* 1907. [5 entries.]

I. (£10.)—THE HON. E. W. B. PORTMAN, Hestercombe, Taunton, **Jill 3rd** (21935), born 1st February, bred by R. Cook, Crazelowman, Tiverton, Devon ; s Capton Duke (4540), d Jill 1st, s d Beauty's Duke (4530).

II. (£5.)—THE HON. E. W. B. PORTMAN, **True Type 9th** (22223), born 16th January, bred by E. C. Norrish, Blackhayes, Sandford, Crediton, Devon ; s Capton Field Marshal (4918), d Sandford True Type 6th (18989), s d Hestercombe Redlight (4417).

R.—W. E. Mallett, Rainbow Wood, Bath, **Ruby's Beauty,** born 1st May, bred by J. Surridge, Manor Farm, Brompton Ralph, Wiveliscombe ; s Durston Ruby (5235), d Beauty 7th (Vol. xxxii.), s d Deacon (4377).

V.H.C.—T. S. Morgan, Whimple, Exeter, Devon, **Lady Dawson,** born 6th July ; s Lord Daws 8th (5582), d Jessamine (17542), s d Councillor (3407).

Class 50.—*Devon Heifer, calved in* 1908. [15 entries.]

I. (£10.)—The Hon. E. W. B. Portman, Hestercombe, Taunton, **Hestercombe Fable** (Vol. xxxii.), born 3rd February ; s Cæsar (5174), d Famous 8th (19080), s d Rent Day (3799).

II. (£5.)—F. J. Merson, Farringdon, North Petherton, Bridgwater, **Daisy,** born 1st January ; s Holcombe Star (5551), d Duchesse 9th (17683), s d Bold Robin (3694).

III. (£2.)—The Hon. E. W. B. Portman, **Hestercombe Cherry** (Vol. xxxii.), born 10th January ; s Referee (5643), d Hestercombe Charity (20900), s d Chieftain (4164).

R. & H.C.—W. E. Mallett, Rainbow Wood, Bath, **Miss Frolic,** born 29th January, bred by J. T. Ensor, Wimborne, Dorset ; s Goldfinder (5521), d Leicester Frolic 3rd (20681), s d Marquis of Pound (4849).

H.C.—E. Clatworthy, Cutsey, Wellington, Somerset, **Cutsey Favourite,** born 4th January ; s Ivanhoe (5024), d Cutsey Frolic (19920), s d Bickley Opal (4533).—T. S. Morgan, Whimple, Exeter, Devon, **Whimple Beauty 11th** (Vol. xxxii.), born 12th January ; s Gladiator (5253), d Whimple Beauty 3rd (19570), s d Hestercombe Redlight (4417).—Viscount Portman, Bryanston, Blandford, **Bryanston Pippin,** born 21st January ; s Prince (5095), d Primitive s d Chieftain (4164).

C.—E. Clatworthy, **Cutsey Geranium 2nd,** born 15th February ; s Ivanhoe (5024), d Geranium (17539), s d Councillor (3407).—W. Lethbridge, Home Farm, Wood, Okehampton, **Wood Countess,** born 6th May ; s Coroner (5467), d Duchess 3rd of Halsdon (18014), s d Lord Blagdon (2999).—W. E. Mallett, **Miss Sally,** born 9th May, bred by E. C. Norrish, Blackhayes, Sandford, Crediton, Devon ; s Capton Royalman (5186), d Capton Royal Sally (19867), s d Royalist 2nd of Pound (3807).—F. J. Merson, **Plum,** born 6th January ; s Holcombe Star (5551), d Primrose 13th (20840), s d Consul (4553).—Viscount Portman, **Bryanston Quarrel,** born 7th February ; s Overton Eclipse (5078), d Compton Quibble (22315), s d Compton Jupiter (4949).—The Hon. E. W. B. Portman, **Hestercombe Peeress** (Vol. xxxii.), born 8th February ; s Cæsar (5174), d Progress (17544), s d Councillor (3407).

Class 51.—*Devon Bull, calved in* 1905 *or* 1906. [3 entries.]

I. (£10.)—Sir G. A. H. Wills, Bart., Northmoor, Dulverton, **Northmoor Royal** (5873), born 18th February, 1906, bred by the late Sir F. Wills, Bart., Northmoor, Dulverton ; s Pound Mayor (4850), d Hursley Fancy 5th (18088), s d Dreadnought (4178).

II. (£5.)—A. S. Browne, Buckland Filleigh, Highampton, **Royalman,** born 12th April, 1906, bred by B. C. Shepherd, Knowle Hall, Bridgwater ; s Kemble (4614), d Hestercombe Roseleaf 2nd (17847), s d Duke of Pound 29th (3725).

Class 52.—*Devon Bull, calved in* 1907. [8 entries.]

I. (£10.)—Mrs. A. C. Skinner & Son, Pound, Bishops Lydeard, **Pound Gladiator** (6169), born 15th January; s Cæsar (5174), d Goodgirl (14663), s d Goodboy (2414).

II. (£5.)—The Hon. E. W. B. Portman, Hestercombe, Taunton, **Hestercombe Novelist** (6112), born 24th March; s Cæsar (5174), d Telltale (20915), s d Broad Boy (2932).

III. (£2.)—W. E. Mallett, Rainbow Wood, Bath, **Cutsey Gem**, born 4th March, bred by E. Clatworthy, Cutsey, Wellington, near Taunton; s Rufus (5370), d Cothelstone Grace (19457), s d Lord Culverhay (3469).

R.—The Lord Clinton, Heanton Satchville, near Dolton, North Devon, **Broad Arrow 3rd**, born 21st February, bred by R. Cook, Crazelowman, Tiverton, Devon; s Capton Duke (4540), d Broad 12th (15599), by Cherry Prince (3245).

H.C.—Viscount Portman, Bryanston, Blandford, **Compton Equal** (6007), born 26th January, bred by J. Chick, Compton Valence, Dorchester; s Overton Eclipse (5078), d Compton Total (19338).

Class 53.—*Devon Bull, calved in* 1908. [6 entries.]

I. (£10.)—The Hon. E. W. B. Portman, Hestercombe, Taunton, **Hestercombe Bondsman** (Vol. xxxii.), born 14th January; s Broker (5439), d Cothelstone Sweetbriar (20020), s d Land Agent (4799).

II. (£5.)—Mrs. A. C. Skinner & Son, Pound, Bishops Lydeard, **Pound Monk**, born 3rd April; s Capton Ploughboy (4923), d Pound Moss Rose 37th (20970), s d Kruger (4229).

III. (£2.)—T. S. Morgan, Whimple, Exeter, Devon, **Whimple Pimpernel** (Vol. xxxii.), born 2nd January; s Gladiator (5253), d Whimple Kitty 1st (19573), s d Westercombe Redlight (4417).

R.—T. S. Morgan, **Lord Daws 3rd** (Vol. xxxii.), born 3rd January, bred by J. Sellick, Courtlands, Wiveliscombe, Somerset; s Lord Daws 8th (5582), d Pink (20959), s d Deacon (4377).

SOUTH DEVON.

Class 54.—*South Devon Cow, in-Milk, calved before* 1906. [9 entries.]

I. (£10) and Special*—B. Luscombe, South Langston, Kingsbridge, **May 4th** (5453), born 24th December, 1903; s Masher (769), d May (3481), s d New Year's Gift.

II. (£5) and **R.** for Special*—W. P. Vosper, Merafield Plympton, South Devon, **Orange Girl**, born 8th March, 1904; s Drummer (975), d Cowslip 4th (3923), s d Prince Edward (517).

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* Given by Sir Harry Trelawney Eve, a Challenge Cup, value £21, for the best Cow or Heifer in the South Devon Classes, entered in or eligible for entry in the South Devon Herd Book, and the property of a member of that Society.

III. (**£2.**)—Butland Bros., Leigham, Plympton, South Devon, **Handsome** (4040), born 27th March, 1900; s Cromer (969), d Beauty 1st (1000), s d Melton.

R.—J. Luscombe, Coarswell, Ugborough, South Devon, **Bring Good,** born 22nd February, 1904; s Masher, d Buttercup, s d Marmion.

H.C.—W. P. Vosper, **Laura** (5676), born 20th February, 1903; s Drummer (975), d Cowslip 4th (3923), s d Prince Edward (517).

Class 55.—*South Devon Heifer, calved in* 1906. [4 entries.]

I. (**£10.**)—W. and H. Whitley, Primley Farm, Paignton, Devon, **Cactus 2nd** (7501), born 1st May, bred by J. S. Wroth, Coombe, Aveton Gifford; s Dan Leno (2111), d Cactus (5744).

II. (**£5.**)—Butland Bros., Leigham, Plympton, South Devon, **Handsome 4th** (6956), born 15th March; s Leigham Champion (1667), d Handsome (4040), s d Cromer (969).

R.—J. Luscombe, Coarswell, Ugborough, South Devon, **Crocus,** born 4th January; s Hard Luck, d Cheerful, s d Arch Duke.

H.C.—Butland Bros., **Beauty 11th** (6948), born 2nd March; s Leigham Champion (1667), d Beauty 6th (5262), s d Saltram (1220).

Class 56.—*South Devon Heifer, calved in* 1907. [11 entries.]

I. (**£10.**)—D. Camp, Widland, Modbury, **Model** (7604), born 3rd January; s Macbeth (1924), d Sunbeam 3rd (3387), s d Marmion (631).

II. (**£5.**)—B. Luscombe, South Langston, Kingsbridge, **Bridesmaid** (7826), born 1st July; s Marquis (2175), d Dairymaid 4th, s d General Buller (1138).

III. (**£2.**)—Butland Bros., Leigham, Plympton, South Devon, **Snowdrop 4th** (7601), born 5th March; s Good Sort (2378), d Snowdrop (4424), s d Happy Jack (874).

R.—F. B. Mildmay, M.P., Flete, Ivybridge, South Devon, **Primula** (7918), born 21st July; s Duke of Devonshire (1862), d Pinkey 2nd (5511), s d The King (1383).

V.H.C.—W. P. Vosper, Merafield, Plympton, South Devon, **Opal,** born 27th May; s Good Times (2397), d Lady's Maid (5674), s d Lord Roberts (1328).

H.C.—W. and H. Whitley, Primley Farm, Paignton, Devon, **Primley Ada** (8184), born 30th April; s Manager (2173), d Fancy (3321).

C.—F. W. Rowe, Trevego, Lostwithiel, Cornwall, Dewdrop (8006), born 19th July; s Brutus (2299), d Snowdrop 2nd (5589), s d Merry Boy (1495).

Class 57.—*South Devon Heifer, calved in* 1908. [8 entries.]

I. (**£10.**)—W. and H. Whitley, Primley Farm, Paignton, Devon, **Primley Bluebell,** born 24th February; s Manager (2173), d Princess (4341).

II. (**£5.**)—W. P. Vosper, Merafield, Plympton, South Devon, **Sibella,** born 5th January; s Hardwicke (2147), d Primrose 3rd (5690), s d Drummer (975).

III. (**£2.**)—W. P. Vosper, **Alexander 2nd,** born 14th January ; s Hardwicke (2147), d Alexandra (5119), s d Drummer (975).

R.—B. Luscombe, South Langston, Kingsbridge, **May Girl,** born 5th January ; s Marquis (2175), d May 4th (5453), s d Masher (769).

H.C.—F. W. Rowe, Trevego, Lostwithiel, Cornwall, **Cinderella,** born 24th March ; s Odd Character (1708), d Buttercup 3rd (4253), s d Druid (729).

Class 58.—*South Devon Bull, calved in or before* 1906. [4 entries.]

I. (**£10**) and Special*—Hawken & Son, Okenbury, Kingston, Kingsbridge, Devon, **Elector** (2354), born 25th January, 1905, bred by H. Fairweather, Malston, Kingsbridge ; s High House Champion (1898), d Milkmaid 2nd (4536), s d Bruin (709).

II. (**£5**) and **R.** for Special*—J. S. Wroth, Coombe, Aveton Gifford, **Marquis,** (2175), born 20th June, 1904 ; s Nimrod (1191 S.D.H.B.), d Star's Marchioness (3659 S.D.H.B.), s d Marmion (631 S.D.H.B.).

R.—J. H. R. Wills, Stokeley Barton, Kingsbridge, **Eclipse** (2124), born 20th April, 1904, bred by N. Boon, Rewe, Marlborough ; s Marmaduke (1488), d Rose 3rd (2700).

H.C.—J. Luscombe, Coarswell, Ugborough, South Devon, **Challenger,** born 14th April, 1903, bred by B. Luscombe, South Langston, Kingston, Kingsbridge ; s Big Ben, d Pretty Maid.

Class 59.—*South Devon Bull, calved in* 1907. [5 entries.]

I. (**£10.**)—W. and H. Whitley, Primley Farm, Paignton, Devon, **Primly Archduke** (2991), born 18th March, 1907 ; s Manager (2173), d Curly (4218).

II. (**£5.**)—J. Coaker, Blagdon Barton, Paignton, Devon, **Reuben** (3014), born 10th February, bred by — Boon, Rewe, Kingsbridge, South Devon ; s Duke (1433), d Maggie (4405).

R.—B. Luscombe, South Langston, Kingsbridge, **Prince Danilo** (2997), born 26th February ; s Marquis (2175), d Primrose (4529), s d General Buller (3118).

H.C.—J. Wakeham, Ley, Diptford, South Brent, Devon, **Ley Marquis** (2941), born 8th February ; s Bunator (1819), d Dewdrop (7417), s d Jack Tar (1321).

Class 60.—*South Devon Bull, calved in* 1908. [11 entries.]

I. (**£10.**)—Butland Bros., Leigham, Plympton, Devon, **Leigham Sort,** born 12th March ; s Token (2167), d Handsome (4040), s d Cromer (969).

II. (**£5.**)—J. S. Wroth, Coombe, Aveton Gifford, **Minister,** born 20th April ; s Star's Duke (1764 S.D.H.B.), d Favourite 6th (6306 S.D.H.B.), s d Duke of York (1439 S.D.H.B.).

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* Given by Sir Harry Trelawney Eve, a Challenge Cup, value £21 for the best Bull in the South Devon Classes, entered or eligible for entry in the South Devon Herd Book, and the property of a member of that Society.

III. (£2.)—W. C. SPENCER, Manor Farm, Hillfield, Cattistock, Dorset, **Duke of Somerset** (3145), born 23rd March, bred by W. S. Harris, Stoke Gabriel, South Devon ; s Cow Boy (2324), d Blossom 3rd (4502), s d Goodenough (1307).

R.—H. HAWKEN & SON, Okenbury, Kingston, Kingsbridge, Devon, **Protection,** born 24th January ; s Elector (2354), d Princess (5956), s d Young Marmion (1579).

V.H.C.—W. P. VOSPER, Merafield, Plympton, South Devon, **Merafield Barrister,** born 7th May ; s Good Times (2379), d Veronique (6256), s d Lord Roberts (1328).

SHORTHORN.

(The 1st Prize in Class 61 was given by the Shorthorn Society, and the 1st Prize in Class 62 by the Dairy Shorthorn (Coates's Herd Book) Association.

CLASS 61.—*Pedigree Shorthorn Dairy Cow, in Milk, four years old and upwards on May* 26, *eligible for and entered in Coates's Herd Book, or Pedigree sent for such entry previous to the Show, and not having previously won a similar prize given by the above-named Society or Association in* 1909, *milked in the ring before judging, under Condition* 63. [7 entries.]

I. (£10.)—LORD ROTHSCHILD, Tring Park, Tring, Herts, roan, **Gift 2nd,** born 4th August, 1901, bred by W. Kendall, Kiln Farm, Farleton, Carnforth ; s Stanley (77954), d Gift (Vol. li., p. 691), s d Bridegroom (68269).

II. (£5.)—C. R. W. ADEANE, Babraham Hall, Cambridge, roan, **Moss Rose 2nd** (Vol. liv., p. 455), born 20th February, 1900, bred by T. Richardson, The Wreay, Wigton ; s Viscount Barrington 3rd (73834), Moss Rose, s d Shapely's Heir (61779).

R.—C. R. W. ADEANE, **Ingram's Rose** (Vol. liv., p. 455), born 15th April, 1899, bred by A. Ritson, Micklethwaite, Wigton ; s Baron Ingram (72003), d Rose 6th, s d Prince Battenberg (53436).

H.C.—LORD ROTHSCHILD, roan, **Carril 33rd,** born 28th August, 1900, bred by J. W. Sanders, Gilmorton, Lutterworth ; s Duke of Warlaby (72423), d Carril 21st (Vol. xlix., p. 850), s d Sweet William (73750).

CLASS 62.—*Pedigree Shorthorn Dairy Cow, in Milk, under four years old on May* 26, *eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize given by the above-named Society or Association in* 1909, *milked in the ring before judging, under Condition* 63. [8 entries.]

I. (£10.)—THE MARQUIS OF WINCHESTER, Amport St. Mary's, Andover, Hants, red, **Lady Morris,** born 6th February, 1906, bred by the late Sir W. Lawson, Bart., Brandon, Carlisle ; s Morello (84176), d Lady Barclay, s d Oxford Duke of Calthwaite 36th (73170).

II. (**£5.**)—LORD ROTHSCHILD, Tring Park, Tring, Herts, red, **Cherry Bloom,** born 10th September, 1905, bred by W. Bateman, Beaumont Grange, Halton, Lancaster; s Prince (96482), d Blossom 25th (Vol. liii., 1162), s d Fashion (76663).

R.—LORD ROTHSCHILD, roan, **Lady 26th,** born 4th April, 1906, bred by A. Ritson, Micklethwaite, Wigton, Cumberland; s Abbotsford 5th (75981), d Lady 24th (Vol. li., p. 891), s d Earl of Ava (76582).

H.C.—C. R. W. ADEANE, Babraham Hall, Cambridge, red and white, **Babraham Nymph,** born 23rd December, 1905; s Prince Pericles 24th (86953), d Babraham Norna, s d Red Lord 15th (77593).

CLASS 63.—*Shorthorn Cow in-Milk, calved before* 1906. [2 entries.]

I. (**£10.**)—W. NICHOLSON, Basing Park, Alton, Hants, roan, **Verbena 57th,** born 28th March, 1905; s Royal Standard (77760), d Verbena 39th, s d Audacious (73968).

CLASS 64.—*Shorthorn Heifer in-Milk, calved in* 1906. [4 entries.]

I. (**£10.**)—VISCOUNT TREDEGAR, Tredegar Park, Newport, Mon., red, **Tredegar Lady Bective,** born 28th November, 1906; s Neptune, (92653), d Lady Bective 9th, s d Sir Joseph (75677).

II. (**£5.**)—R. CORNELIUS, Bankfields, Eastham, Cheshire, red, **Jilt 44th,** born 16th March, bred by G. Hill, Little Haddo, Aberdeen; s Count (80770), d Rosebud, s d Allan Gwynne (66609).

R.—W. NICHOLSON, Basing Park, Alton, Hants, white, **Princess 78th,** born 2nd January; s Royal Standard (77760), d Princess 66th, s d Audacious (73968).

CLASS 65.—*Shorthorn Heifer, calved in* 1907. [10 entries.]

I. (**£10.**)—W. T. GARNE & SON, Aldsworth, Northleach, R.S.O., Gloucester, roan, **Village Belle,** born 25th February; s Village Beau (87631), d Jewel Case, s d Provider (77542).

II. (**£5.**)—S. E. DEAN & SONS, Dowsby Hall, Bourne, roan, **Nonpariel Bud 2nd,** born 8th January, bred by J. A. K. Falconer, Long Sutton House, Winchfield; s Ascott Constellation (85184), d Chiddingstone Nonpariel, s d Sebastopol Jet (84733).

III. (**£2.**)—LORD SHERBORNE, Sherborne Park, Northleach, roan, **Buscot Sally,** born 28th February, bred by Sir A. Henderson, Bart., Buscot Park, Farringdon; s Wanderer's Prince (78105), d Salad, s d Cashier (68326).

R.—H. J. S. TORY, Damory Court, Blandford, Dorset, roan, **Damory Fanny,** born 20th January; s Damory Gallant Victor (88340), d Gorgeous, s d Fitzalan (76688).

H.C.—J. COSSINS, Tarrant Rawston, Blandford, Dorset, roan, **Tarrant Lady Mary,** born 10th March; s Trevor Gwynne (90354), d Portiabella (Vol. liv., p. 613), s d Croesus (78659).

Class 66.—*Shorthorn Heifer, calved in* 1908. [14 entries.]

I. (£10.)—S. E. Dean & Sons, Dowsby Hall, Bourne, roan, **Florrie**, born 17th May, bred by A. T. Gordon, Combscauseway, N.B.; s Royal Velvet (84655), d Fanfare 6th, s d Walcot (78101).

II. (£5.)—Lord Sherborne, Sherborne Park, Northleach, roan, **Sherborne Fairy**, born 13th January; s Scottish Monarch (77828), d White Fairy, s d Fortune (70467).

III. (£2.)—S. E. Dean & Sons, roan, **Queen J. 31st**, born 25th March, bred by W. James, Barteliver, Grampound Road, Cornwall; s Janissary 5th (83779), d Queen J. 1st, s d Vain Hampton (75804).

R.—J. D. Willis, Bapton Manor, Codford, Wilts, roan, **Fairy Princess**, born 9th February; s Prince of the Blood (96532), d Fairy Queen 17th, s d Ivanhoe (79109).

H.C.—Viscount Tredegar, Tredegar Park, Newport, Mon., roan, **Maid of Tredegar**, born 22nd January; s Lyndhurst (95939), d Scarlet Runner, s d First Favour.—W. Nicholson, Basing Park, Alton, Hants, roan, **Laurel 30th**, born 2nd January; s Chaucer (94614), d Laurel 24th, s d Aristotle (65083).

Class 67.—*Shorthorn Bull, calved in* 1905 *or* 1906. [3 entries.]

I. (£10.)—J. D. Willis, Bapton Manor, Codford, Wilts, white, **Stonecrop**, born 9th April, 1905, bred by Lord Brougham, Penrith, Cumberland; s Stoneytown Pride, d Furze 5th, s d Merry Archer (75066).

II. (£5.)—R. J. Balston, Bilsington Priory, near Ashford, Kent, roan, **Tehidy Robin Hood**, born 14th December, 1906, bred by A. F. Bassett, Tehidy, Camborne, Cornwall; s Royal Estate (89925), d Tehidy Royal Countess 3rd, s d Shamrock (84724).

R.—P. S. Dollar, Charlton Hill, Feniton, Ottery St. Mary, red, **Diver**, born 26th December, 1906, bred by F. Reynard; s Jackston (29049), d Dimity (Vol. liii., p. 1128), s d Ryl. E.M. Oxford 12th (79811).

Class 68.—*Shorthorn Bull, calved in* 1907. [4 entries.]

I. (£10) and Champion*—J. H. Maden, J.P., Rockcliffe House, Bacup, roan, **Duke of Hoole**, born 20th January, bred by R. and T. Harrison, Manor House, Much Hoole; s Strorran Marquis 13th (90268), d Red Blossom 2nd (Vol. lii., p. 764), s d Chancellor (80657).

II. (£5.)—S. E. Dean & Sons, Dowsby Hall, Bourne, red, **Sanquhar Pearl** (100538), born 3rd January, bred by A. W. and A. M. Law, Mains of Sanquhar, N.B.; s Pride of Holl (92854), d Florence 3rd, s d Sanquhar Model (84697).

R.—T. C. Candy, Woolcombe, Cattistock, Dorset, roan, **Border Champion**, born 15th May, 1907, bred by A. S. Elliot, Hollybush, Galashiels; s Lord Maxwell (92320), d Ringlets 5th (Vol. liii., p. 731), s d Coming Star (83158).

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* Given by the Shorthorn Society, for the best Bull in Class 67, 68 or 69, entered in or eligible for entry in Coates's Herd Book.

CLASS 69.—*Shorthorn Bull, calved in* 1908. [11 entries.]

I. (**£10**) and **R.** for Champion*—S. E. DEAN & SONS, Dowsby Hall, Bourne, red, **Proud Roman,** born 25th January, bred by J. M. William, Garbity, Orton Station, N.B. ; s Achilles (93962), d Proud Rosebud, s d Pride of Avon (86878).

II. (**£5.**)—T. C. CANDY, Woolcombe, Cattistock, Dorset, roan, **Sea Monarch,** born 9th January, bred by T. Stokes, Warmington, Oundle ; s Neptune (92653), d Eaglethorpe Amy 4th (Vol. liii., p. 1229), s d Royal Referee (79835).

III. (**£2.**)—M. A. M. DE HOZ, Berkeley House, Berkeley Square, London, red, **Royal Bank,** born 4th February, bred by J. Marr, Uppermill, Aberdeenshire ; s Prince of Ceremonies (92903), d Rosemary 221st, s d Aberdeen Bard (80309).

R.—J. D. WILLIS, Bapton Manor, Codford, Wilts, roan, **Bapton Conrad,** born 27th January ; s Prince of the Blood (96532), d Cordelia, s d C.I.V. (80707).

H.C.—H.M. THE KING, Sandringham, roan, **Competitor,** born 19th January ; s King Edward (86323), d Complex (Vol. liv., p. 958), s d Scottish Beau (695521). —A. F. BASSET, Tehidy, Camborne, Cornwall, roan, **Tehidy Camp Fire,** born 27th January ; s Royal Estate (89925), d Royal Gwynne, s d Royal Sovereign (77756).

C.—W. T. GARNE & SON, Aldsworth, Northleach, R.S.O., Gloucester, roan, **Pretender,** born 19th January ; s Village Coronet (97548), d Patient Lass, s d Aldsworth Pioneer (82701).

HEREFORD.

CLASS 70.—*Hereford Cow, in-Milk, calved before* 1906. [6 entries.]

I. (**£10**) and Champion(**£10**)†—EARL OF COVENTRY, Croome Court, Worcester. **Merriment,** born 29th March, 1903 ; s Fortunio (21396), d Misbelief (Vol, xxxiv., p. 262), s d Miscreant (19515).

II. (**£5.**)—CAPTAIN E. S. A. HEYGATE, Buckland, Leominster, **Shooting Star,** born 24th April, 1904 ; s Comet (22792), d Bellarena, s d Fine Lad (19414).

III. (**£2.**)—G. D. FABER, C.B., M.P., Rush Court, Wallingford, **Loose Strife,** born 1st May, 1905 ; s Curly Boy, d Lucerne, s d Jubilee 2nd.

R.—D. A. THOMAS, M.P., Llanwern, Newport, Mon., **Carnation,** born 28th February, 1905, bred by Mrs. Hamlen-Williams, Kingsland, Herefordshire ; s Lord Sutton (20162), d Dianthus 5th (Vol. xxxiv., p. 704), s d Diplomat (18328).

H.C.—W. THOMAS, The Hayes, Sully, Cardiff, **Treasure,** born 29th July, 1900 ; s King John (20114), d Ringdove 4th, s d Standard (14194).

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* Given by the Shorthorn Society, for the best Bull in Class 67, 68 or 69, entered in or eligible for entry in Coates's Herd Book.

† Given by the Hereford Herd Book Society, for the best Cow or Heifer in Classes 70 to 73.

Class 71.—*Hereford Heifer, in-Milk, calved in* 1906. [5 entries.]

I. (**£10.**)—P. Coats, Sheepcote, Clifford, Herefordshire, **Plum,** born 15th February; s Endale (21366), d Pretty Lass (Vol. xxxiii., p. 283), s d Prince Richard (17450).

II. (**£5.**)—W. B. Tudge, Stepaside, Onibury, Salop, **Gwendoline,** born 28th October, bred by W. Tudge, Summer Court, Kington; s Commandant (22040), d Royal Daisy 5th (Vol. xxxvi., p. 654), s d Rhodesia (19044).

R.—D. A. Thomas, M.P., Llanwern, Newport, Mon., **Susannah,** born 2nd January, bred by W. Thomas, The Hayes, Sully, Glamorganshire; s Perfection (22450), d Gazelle 4th (Vol. xxxi., p. 663), s d Character (17762).

H.C.—H. W. Taylor, Showle Court, Ledbury, **Lady Penzance,** born 17th February; s Jack Wilton (23532), d Fair Alice, s d Samson (20312).

C.—H. W. Taylor, **Bessie Brown,** born 13th January; s Arabian (23869), d Little Lady, s d Home Office (20073).

Class 72.—*Hereford Heifer, calved in* 1907. [4 entries.]

I. (**£10**) and **R.** for Champion*—R. Bright, Ivington Bury, Leominster, **Ivington Bess,** born 1st January; s Marmion (20844), d Bright's Oyster Girl, s d Glencoe (17279).

II. (**£5.**)—P. Coats, Sheepcote, Clifford, Herefordshire, **Ladybird 2nd,** born 12th February; s Endale (21366), d Ladybird (Vol. xxxviii., p. 339), s d Bage Protector (21167).

R.—H. W. Taylor, Showle Court, Ledbury, **Mayflower,** born 17th April; s Briton (21973), d Lucinda, s d Sorcerer (20339).

Class 73.—*Hereford Heifer, calved in* 1908. [8 entries.]

I. (**£10.**)—J. G. Cooke-Hill, Shelsley Bank, Stanford Bridge, Worcester, **Shelsley Queen,** born 22nd January, bred by the late W. H. Cooke, The Green, Stanford Bridge, Worcester; s Gambler (20639), d Hawthornden, s d Ruler (16360).

II. (**£5.**)—Mrs. E. Medlicott, Bodenham, Leominster, **Blanche 4th,** born 31st January; s Locarno (20797), d Pigeon 9th (Vol. xxxiii., p. 498), s d Montezuma (18486).

III. (**£2.**)—W. Thomas, The Hayes, Sully, Cardiff, **Bonnie Belle,** born 4th January; s Perfection (22450), d Gazelle, s d Royalist (14124).

R.—G. Butters, Hill House, Newton, Leominster, **Countess,** born 7th February; s Newton Tumbler (24813), d Prairie Snowdrop (Vol. xxviii., p. 240), s d Prairie Star (15567).

V.H.C.—R. Bright, Ivington Bury, Leominster, **Bright Ellen,** born 20th January; s Tenor (25016), d Ellen, s d Marmion (20844).

H.C.—G. D. Faber, C.B., M.P., Rush Court, Wallingford, **Royal Sovereign,** born 9th January; s Rob Roy, d My Queen, s d Lord Roberts.

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* Given by the Hereford Herd Book Society, for the best Cow or Heifer in Classes 70 to 73.

Class 74.—*Hereford Bull, calved in* 1905 *or* 1906. [3 entries.]

I. (**£10**) and Champion (£10)*—P. Coats, Sheepcote, Clifford, Hereford, **Sunny Jim** (25808), born 5th April., 1906; s Endale (21366), d Rosie (Vol. xxxviii., p. 342), s d Bage Protector (21167).

II. (**£5.**)—H. W. Taylor, Showle Court, Ledbury, **Goliath** (25405), born 8th June, 1906; s Jack Wilton (23532), d Titmouse, s d Hermit (14599).

R.—Sir W. St. A. Rouse Boughton, Bart., Downton Hall, Ludlow, **Garrison** (24615), born 7th January, 1905, bred by S. Robinson, Lynhales, Kington; s Commandant (22040), d Lynhales Silk 2nd (Vol. xxxiii., p. 604), s d Lulham (13234).

Class 75.—*Hereford Bull, calved in* 1907. [8 entries.]

I. (**£10**) and **R.** for Champion*—J. G. Cooke-Hill, Shelsley Bank, Stanford Bridge, Worcester, **Shelsley**, born 15th February, bred by the late W. H. Cooke, The Green, Stanford Bridge, Worcester; s Gambler (20639), d Hawthornden, s d Ruler (16360).

II. (**£5.**)—Sir J. R. G. Cotterell, Bart., Garnons, Herefordshire, **Royal Ringer** (26458), born 20th March, bred by W. Griffiths, Aldersend, Hereford; s Change Ringer (24478), d Britannia, s d Bruce (18258).

III. (**£2.**)—C. T. Pulley, Lower Eaton, Hereford, **Eaton Renown** (26091), born 20th January; s Eaton Champion (21351), d Ashleaf, s d Success (20357).

R.—Mrs. E. Medlicott, Bodenham, Leominster, **Lochiel** (26261), born 20th May; s Locarno (20797), d Blossom 2nd (Vol. xxxvii., p. 554), s d Lancer (21515).

V.H.C.—W. Tudge, Summer Court, Kington, Herefordshire, **Royal Rameses** (26456), born 17th February, bred by J. Tudge, Duxmoor, Craven Arms; s Rameses 2nd (24238), d Royal Gem (Vol. xxxiv., p. 672 H.H.B.), s d Francis (13800).

H.C.—J. Tudge, Duxmoor, Craven Arms, Salop, **Oney Jasper** (26345), born 17th April, bred by F. D. Bach, Onibury, Craven Arms, Salop; s Whitfield Roberts (21880), d Melody (Vol. xxxviii., p. 238), s d Douglas (20583).

C.—G. Butters, Hill House, Newton, Leominster, **Sailor Prince** (26465), born 3rd February, bred by W. T. Barneby, Saltmarshe Castle, Bromyard; s Nelson (21625), d Hapless Spark (Vol. xxxiv., p. 178), s d Happy Hampton (16097).

Class 76.—*Hereford Bull, calved in* 1908. [11 entries.]

I. (**£10.**)—A. E. Hill, Egleton Court, Ledbury, **Egleton Hero**, born 5th February; s Overhead (24837), d Curly 54th, s d Whitfield Roberts (21880).

II. (**£5.**)—Sir W. St. A. Rouse Boughton, Bart., Downton Hall, Ludlow, **Marcus**, born 30th January; s Beresford (23901), d Tiny (Vol. xxx., p. 201), s d Royalist 3rd (16958).

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* Given by the Hereford Herd Book Society, for the best Bull in Classes 74 to 76.

III. (**£2.**)—C. T. Pulley, Lower Eaton, Hereford, **Eaton Marvel**, born 13th January; s Eaton Sensation (24566), d Broady 24th, s d Strafford (14946).

R.—Earl of Coventry, Croome Court, Worcester, **Gamaliel**, born 13th January; s Maxwell (24155), d Gallipot (Vol. xxxiii., p. 293), s d Viscount (18648).

V.H.C.—S. Robinson, Lynhales, Kington, Herefordshire, **Commander**, born 13th February; s Commandant (22040), d Onyx, s d Curly Boy.

H.C.—Earl of Coventry, **Galen**, born 1st January; s Lama (23550), d Galloon (Vol. xxxviii., p. 360), s d Fairy King (21380).

C.—Sir J. R. G. Cotterell, Bart., Garnons, Herefordshire, **Larkspur**, born 6th February; s All Right (24348), d Lupin, s d Rameses (23100).

SUSSEX.

Class 77.—*Sussex Cow or Heifer, in-Milk, calved in or before* 1906. [4 entries.]

I. (**£10**) and Special*—W. G. Fladgate, Apsley, Thakeham, Pulborough, Sussex, **Apsley Fairy** (10757), born 19th January, 1906; s Silver King (2022), d Fairy (8818), s d Drungewick Prebble 2nd (1877).

II. (**£5.**)—Mrs. Montefiore, Worth Park, Crawley, Sussex, **Coquette**, born 19th August, 1902, bred by Lord Derby, Orchardmains; s Diploma, d Cuckoo.

V.H.C.—E. E. Braby, Drungewick Manor House, Rudgwick, Sussex, **Drungewick Lady** (9556), born 18th December, 1904; s Earl of Drungewick (1878), d Ladysmith (7887), s d Prince of Drungewick (1530).

C.—C. Newington, Oakover, Ticehurst, Sussex, **Braceline** (10707), born 8th January, 1906, bred by the late Earl of Derby, Orchardmains, Tonbridge, Kent; s Dragoon (1881), d Butter Maid, s d Huntsman (1747).

Class 78.—*Sussex Heifer, calved in* 1907. [3 entries.]

I. (**£10.**)—C. Newington, Oakover, Ticehurst, Sussex, **Charming Countess** (11213), born 8th January, bred by the late Earl of Derby, Orchardmains, Tonbridge, Kent; s Prebble Dog Rose (2124), d Charming (9186), s d Huntsman (1747).

II. (**£5.**)—W. G. Fladgate, Apsley, Thakeham, Pulborough, Sussex, **Apsley Fairy 2nd** (11275), born 4th February; s Silver King (2022), d Fairy (8818), s d Drungewick Prebble 2nd (1877).

C.—T. Bannister, Limehurst, Hayward's Heath, Sussex, **Limehurst Galatea** (11152), born 27th January; s Prince of Ticehurst (1750), d Friston Galatea (9297), s d Bewbush Nobleman (1721).

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* Given by the Sussex Herd Book Society, a Silver Medal for the best Cow or Heifer in Class 77 or 78.

Class 79.—*Sussex Bull, calved in or before* 1906. [1 entry.]

I. (**£10**) and Special*—E. E. Braby, Drungewick Manor House, Rudgwick, Sussex, **Lord of Drungewick 5th** (2038), born 6th January, 1904; s Duke of Drungewick 3rd (1808), d Ladysmith (7887), s d Prince of Drungewick (1530).

Class 80.—*Sussex Bull, calved in* 1907. [1 entry.]

I. (**£10.**)—Mrs. Montefiore, Worth Park, Crawley, **Proud Prebble**, born 3rd January, bred by Lord Derby, Orchardmains; s Prebble Dog Rose, d Poppy.

ABERDEEN-ANGUS.

(The 1st Prize in Class 81 was given by the English Aberdeen Angus Cattle Association).

Class 81.—*Aberdeen-Angus Cow or Heifer, in-Milk, calved before 1st December*, 1906. [1 entry.]

I. (**£10**) and Silver Medal†—J. J. Cridlan, Home Farm, Maisemore Park, Gloucester, **Blackbird 2nd of Maisemore** (37071), born 9th January, 1904; s Elate (16513), d Benefit 6th of Haynes (21875), s d Monarch 2nd of Advie 11094).

Class 82.—*Aberdeen-Angus Heifer, calved on or after 1st December*, 1906. [2 entries.]

I. (**£10**) and **R.** for Silver Medal‡—G. D. Faber, C.B., M.P., Rush Court, Wallingford, **Gay Favourite of Haynes**, born 6th February, 1907, bred by the late W. B. Greenfield, Haynes Park, Bedford; s Gay Boy of Danesfield, d **Tedfold Favourite**, s d Epigram of Cortachy.

Class 83.—*Aberdeen-Angus Heifer, calved on or after 1st December*, 1907. [3 entries.]

I. (**£10.**)—J. J. Cridlan, Home Farm, Maisemore Park, Gloucester, **Clasp 2nd** (43503), born 9th December, 1907; s Everwise (24436), d Clasp (39165), s d Edgar of Culdees (20419).

II. (**£5.**)—J. J. Cridlan, **Edwina of Maisemore** (43505), born 10th December, 1907; s Idelate (25743), d Edwina of Abergeldie (27814), s d Juryman of Whitelumbs (16732).

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* Given by the Sussex Herd Book Society, a Silver Medal for the best Bull in Class 79 or 80.

† Given by the English Aberdeen-Angus Cattle Association, for the best animal of opposite sex to that awarded the Gold Medal in Classes 81 to 85.

‡ Given by the English Aberdeen-Angus Cattle Association, for the best animal of opposite sex to that awarded the Gold Medal in Classes 81 to 85.

CLASS 84.—*Aberdeen-Angus Bull, calved before December 1st*, 1907. [2 entries.]

I. (**£10**) and Gold Medal*—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, **Everwise** (24436), born 19th January, 1905 ; s Wizard of Maisemore (21465), d Evergreen 7th (33404), s d Eimeo (12450).

CLASS 85.—*Aberdeen-Angus Bull, calved on or after December 1st*, 1907. [3 entries.]

I. (**£10.**)—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, **Rubelate of Maisemore** (28706), born 23rd December, 1907 ; s Ermelate (25576), d Ruby of Maisemore (38743), s d Corsie (20289).

II. (**£5.**)—J. J. CRIDLAN, **Proud Erme** (28602), born 1st January, 1908 ; s Ermelate (25576), d Pride of Maisemore 2nd (38737), s d Wizard of Maisemore (21465).

JERSEY.

(The Prizes in Class 86 were given by the English Jersey Cattle Society.)

CLASS 86.—*Jersey Cow or Heifer, in-Milk, entered or eligible for entry in the English Jersey Herd Book, bred by Exhibitor, and sired in Great Britain or Ireland.* [7 entries.]

I. (**£10.**)—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Hasty,** born 4th May, 1905 ; s Orchid (8644), d Hoo Princess (Vol. xiii., p. 282), s d Victor (5761).

II. (**£6.**)—L. CURRIE, Minley Manor, Farnborough, Hants, whole, **Mary,** born 5th January, 1902 ; s Reminders Sovereign (7005), d Chartreuse (imported), s d Visitor (2140).

III. (**£4.**)—MRS. C. M. MCINTOSH, Havering Park, Romford, Essex, fawn, **Havering Primrose 2nd,** born 20th July, 1906 ; s Mona's Warder (8627), d Havering Primrose (Vol. xi., p. 258).

R. & H.C.—J. H. SMITH-BARRY, Stowell Park, Pewsey, grey and white, **Lady Lavender,** born 18th April, 1907 ; s Sprig (9430), d Lady May, s d Slip (6712).

CLASS 87.—*Jersey Cow, in-Milk, calved before* 1906. [16 entries.]

I. (**£10.**)—LORD ROTHSCHILD, Tring Park, Tring, Herts, whole, **Kenta,** born 6th March, 1905, bred by J. Grosvalet, St. Clement's, Jersey ; s General Fox 2nd (8889), d Pallas 2nd (9644).

II. (**£5.**)—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, whole, **Plaisanterie** (Vol. xiii., p. 387), born 6th September, 1899, bred by A. J. Arthur, St. Ouens, Jersey ; s Nobleman (2555), d Maiden Fair (7843 J.H.B.), s d Aristocrat (2280 J.H.B.).

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* Given by the Aberdeen-Angus Cattle Society, for the best Animal in Classes 81 to 85.

III. (**£2.**)—A. Pocock, Freegrove, Calne, Wilts, whole, fawn, **Freegrove Lily** (Vol. xix., p. 305), born 5th January, 1905; s Speculative (8376), d Lily Gold (Vol. xvii., p. 341), s d Nuriels Golden Lad (7610).

R. & V.H.C.—Lady de Rothschild, Aston Clinton, Tring, whole, **Lady Phyllis**, born 12th March, 1902, bred by E. G. Renouf, St. Martin's; s Tormentor (7685), d Poppy's Violet (8953 R.S.C.).

V.H.C.—W. M. Cazalet, Fairlawne, Tonbridge, whole, **Forfarshire Lucy,** born 24th March, 1902, bred by G. A. Messery, Trinity; s Forfarshire (7207), d Lucy's Lass, s d Trooper (5751).

H.C.—J. de Knoop, Calveley Hall, Tarporley, whole fawn, **Muscotah** (Vol. xix., p. 372), born 1st March, 1904, bred by J. Cooper, St. Brelade's, Jersey; s Warder (3227), d Nautilus (7515).—Mrs. C. M. McIntosh, Havering Park, Romford, Essex, fawn, **Frolicsome 5th,** born 1st January, 1904, bred by P. Andeane, Jersey; s Sam Loates (3094), d Frolicsome 2nd (5868).—Lord Rothschild, broken, **Triangle 2nd,** born 13th December, 1905, bred by J. Barette, St. Mary's, Jersey; s Mourier King (7940), d Triangle (9579).

C.—J. M. F. Fuller, M.P., Jaggard's, Corsham, whole, **Brown Fancy,** born 10th February, 1904, bred by H. Le V. dit Durell, St. Helier's, Jersey; s Golden Jolly (7518), d Magnolia, s d Golden Grain (6238).—The Lord Poltimore, Poltimore Park, Exeter, broken colour, **Diamond,** born 19th July, 1905, bred by the Marquis of Linlithgow; s Belinda's Boy (8080), d Emerald (Vol. xv., p. 274), s d Leyland's Champion (6303).—J. H. Smith-Barry, Stowell Park, Pewsey, Wilts, fawn, **Caprice,** born 28th July, 1905; s Oxford Sunbeam (8650), d Captious, s d Geonnais Lad (6562).

Class 88.—*Jersey Cow or Heifer, in-Milk, calved in* 1906. [15 entries.]

I. (**£10.**)—W. M. Cazalet, Fairlawne, Tonbridge, whole, **Disdainful,** born 4th January; s Western Mail (8759), d Desire, s d Leda's Golden Lad (7568).

II. (**£5.**)—Lord Rothschild, Tring Park, Tring, Herts, whole, **Lady Day,** born 19th February, bred by J. B. Badier, St. Martin's, Jersey; s Majesty (3523), d Lady Whiteley (8990).

III. (**£2.**)—Lord Rothschild, whole, **Quilla's Belle,** born 17th April, bred by P. C. Gallichan, Trinity, Jersey; s Dora's Fox (9210), d Quilla (9447).

R. & V.H.C.—Mrs. C. McIntosh, Havering Park, Romford, Essex, fawn, **Havering Primrose 2nd,** born 20th July, 1906; s Mona's Warder (8627), d Havering Primrose (Vol. xi., p. 258).

V.H.C.—J. H. Smith-Barry, Stowell Park, Pewsey, Wilts, brown, **Flanders Girl,** born 7th January, bred by M. A'court, St. Ouen's, Jersey; s Halloween's Fox (8917), d Lady de Flandre 3rd, s d Joe (4891).

C.—Fowler & de la Perrelle, Porter's Lane, Southampton, fawn, **Roselaise Welcome** (F. 228 J.H.B.), born 16th December, bred by H. Bendell, Jersey; s La Chasse's Boy (3674 J.H.B.), d Roselaise (5758 J.H.B.).—The Lord Poltimore, Poltimore Park, broken colour, **Elmfield Pansy 2nd,** born 27th January, bred by R. C. Le Boutillier, St. Ouen's Jersey; s Flower's Hero (8515), d Elmfield's Pansy (10637 P.S.C.), s d Warwick (8047).—The Lord Poltimore, fawn, **La Chasse Fawny,** born 20th April, bred by P. Le Brocq, St. Ouen's, Jersey.

CLASS 89.—*Jersey Heifer, in-Milk, calved in or since* 1907. [13 entries.]

I. (**£10.**)—LORD ROTHSCHILD, Tring Park, Tring, Herts, whole, **Young Winks 5th,** born 7th February, 1907, bred by J. P. Le Marquand, St. Ouen's, Jersey ; s Plymouth Boy (9031), d Young Winks 2nd (10309).

II. (**£5.**)—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Blue Bell,** born 3rd January, 1907 ; s Jester (7551), d Boogeeki Boo ; s d Dreyfus (7484).

III. (**£2.**)—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, broken, **Elsie's Abbess,** born 26th March, bred by E. Mathews, Little Shardeloes, Amersham, Bucks ; s Elsie's Fox (8503), d Abbess (Vol. xviii., p. 238), s d Carlo's King (6809).

R. & V.H.C.—FOWLER & DE LA PERRELLE, Porter's Lane, Southampton, whole, **Georgette 4th** (F. 250 J.H.B.), born 15th March, 1907, bred by G. Jueguin, Jersey ; s Fancy's King (3677 J.H.B.), d Georgette (9145 J.H.B.).

H.C.—LADY SMYTH, Ashton Court, Bristol, whole, **Sultana,** born 9th April, 1907 ; s Black Sultan (9153), d Lustre (Vol. xix., p. 350), s d Barrister (7719).

C.—J. H. SMITH-BARRY, Stowell Park, Pewsey, Wilts, grey and white, **Lady Lavender,** born 18th April, 1907 ; s Sprig (9430), d Lady May, s d Slip (6172).—FOWLER & DE LA PERRELLE, whole, **Queen Undata** (F. 248 J.H.B.), born 4th February, 1907, bred by P. Alexandre, Jersey ; s Monoter (3762 J.H.B.), d Undata (8471 J.H.B.).—THE LORD POLTIMORE, Poltimore Park, Exeter, whole colour, **Favori's Dorothy 5th,** born 6th January, 1907, bred by the Asylum Committee, St. Saviour's, Jersey ; s Halloween's Fox (8917), d Favori's Dorothy (10237) J.H.B.), s d Favori (6854).

CLASS 90.—*Jersey Heifer, calved in* 1908. [25 entries.]

I. (**£10.**)—SIR E. STERN, Fan Court, Chertsey, Surrey, whole, **Lora,** born 1st August ; s Golden Beam (9247), d Rose, s d Golden Duke (7829).

II. (**£5.**)—MRS. C. M. MCINTOSH, Havering Park, Romford, Essex, fawn, **Havering Princess,** born 1st August ; s La Fosse Hero (9303), d Princess Muriel, s d Combination.

III. (**£2.**)—DR. H. CORNER, Brook House, Southgate, N., broken colour, **Oxford Fairy 2nd,** born 10th April ; s Vixen's Prince, d Fairy, s d Crown Prince (8141).

R. & V.H.C.—W. M. CAZALET, Fairlawne, Tonbridge, whole, **Kentish Maiden,** born 15th April ; s Oakland's Glory (9370), d Lady of Kent 3rd, s d Hearty Fox (3365).

H.C.—L. CURRIE, Minley Manor, Farnbrough, Hants, whole, **Matty,** born 1st August ; s Quality's Hero, d Mischief,s d Madrid (8600).—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Lady Dora 4th,** born 8th May ; s Stormer (9431), d Lady Dora 3rd (Vol. xx.), s d Jester (7551).—THE LORD POLTIMORE, Poltimore Park, Exeter, broken, **Sonia,** born 29th January ; s General Warden (8891), d Princess Seymour (Vol. xx.), s d General Fox 2nd (8886).—LORD ROTHSCHILD, Tring Park, Tring, Herts, whole, **Oxford Merry Lass,** born 31st March, bred by W. J. Alexander, North Road, Hertford ; s Oxford Wrangler (9021), d Monista's Lassie (Vol. xviii., p. 371), s d Leda's Golden Lad (7568).—J. H. SMITH-BARRY, Stowell Park, Pewsey, Wilts, fawn, **Beech Lass 11th,** born 2nd February ; s Brendal Prince (9160), d Beech Lass 7th, s d Golden Grain.

C.—COL. DAVIS, Salt Hill, Slough, whole, **Mona,** born 3rd March ; s Molina's Lad, d Eva of Pontac, s d Pride's Golden Lad.—J. M. F. FULLER, M.P., Jaggard's, Corsham, whole, **Rita's Lady,** born 7th January, bred by G. Dennis, Jersey ; s Castor's Lord (3895), d Rita 2nd (12885).—A. POCOCK, Freegrove, Calne, Wilts, whole, fawn, **Sheriff's Lily,** born 16th April ; s Sheriff, d Freegrove Lily (Vol. xix., p. 305), s d Speculative (8376).—LADY SMYTH, Ashton Court, Bristol, broken, **Bobbette,** born 14th May ; s Halberton's Bob (9268), d Lustre 19th (350), s d Barrister (7719).—R. R. WHEADON, Ilminster, fawn, **Lady Knight,** born 20th May ; s Dorothea's Fox (9211), d Feodora 4th (Vol. xvi., p. 283 E.H.B.).

CLASS 91.—*Jersey Bull, calved in* 1905 *or* 1906. [9 entries.]

I. (**£10**) and Special*—A. MILLER-HALLETT, Goddington, Chelsfield, Kent, whole, **Alfriston's Pride** (9131), born 19th July, 1905 ; s Goddington Brownie (8526), d Alfriston's Gem (Vol. xi., p. 193), s d Golden Lad (3324).

II. (£5.)—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Stormer,** born 23rd March, 1906, bred by Lord Rothschild, Tring Park, Herts ; s Franc Fief's Jolly (8187), d Syren 3rd (imported), (Vol. x., p. 346), s d La Chasse Prince (5243).

III. (£2.)—W. M. CAZALET, Fairlawne, Tonbridge, whole, **Oakland's Glory,** born 27th March, 1906, bred by E. J. Pipon, jun., St. Mary's, Jersey ; s Ida's Glory (8556), d Oakland's Bess (9803).

R. & V.H.C.—LADY SMYTH, Ashton Court, Bristol, whole, **Halberton's Bob** (9268, imported), born 28th May, 1906, bred by P. G. Becquet, St. Saviour's, Jersey ; s Primrose's Raleigh, d Campanile's Lass, s d Agatha's Flying Fox (3256 J.H.B.).

C.—J. DE KNOOP, Calveley Hall, Tarporley, Cheshire, whole fawn, **Inspector,** born 18th April, 1906, bred by J. S. Le Gresby, St. Martin's, Jersey ; s Sultan of Oaklands (3746), d Golden Crock (11579), s d Napoleon Bonaparte (2745).—CAPTAIN J. E. P. SPICER, Spye Park, Chippenham, Wilts, broken, **Sheriff,** born 18th May, 1906, bred by A. Pocock, Freegrove, Calne ; s Barrister (8424), d Lady Everton, s d Royal Sovereign (7655).—SIR E. STERN, Fan Court, Chertsey, Surrey, fawn, **Golden Beam,** born July, 1906, bred by J. H. Smith-Barry ; s Oxford Sunbeam, d Guelder Rose, s d Gronfille's Boy (6582)

CLASS 92.—*Jersey Bull, calved in* 1907. [13 entries.]

I. (**£10**) and **R.** for Special*—LORD ROTHSCHILD, Ting Park, Tring, Herts, whole, **Champion of St. Peter,** born 15th May, bred by J. du Val, St. Peter's, Jersey ; s Golden Champion (8205), d Octavia (Vol. xix., p. 377), s d Successor (7378).

II. (**£5.**)—A. POCOCK, Freegrove, Calne, Wilts, whole, **Jessie's Noble,** born 26th April, bred by J. S. Beaugie, St. Martin's, Jersey ; s Noble of Oaklands (3909 J.H.B.), d Jessie's Bella (9383 J.H.B.), s d St. Lawrence's Jesse (7074 J.H.B.).

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* Given by the Royal Jersey Agricultural Society, for the best Bull in Class 91, 92 or 93, whose dam had won a prize or certificate of merit in any Butter Test Competition recognised by the English Jersey Cattle Society—£10 10s.

III. (£2.)—L. CURRIE, Minley Manor, Farnborough, Hants, whole, **Ladylike's Lad** (imported), born 19th February, bred by I. Manger, Trinity; s Stockwell (3550), d Ladylike (10827).

R. & V.H.C.—LADY SMYTH, Ashton Court, Bristol, whole, **Vandal**, born 6th June; s Vandyck (8748), d Forfarshire Streamlet (imported), s d Forfarshire.

V.H.C.—MRS. C. M. MCINTOSH, Havering Park, Romford, Essex, black, **Lockett's Golden Lad 2nd**, born 16th September, bred by P. Lucas, Jersey; s Lockett's Golden Lad (3856), d Lockett's Welcome (9094).

H.C.—J. DE KNOOP, Calveley Hall, Tarporley, Cheshire, whole fawn, **Beauty's Sailor**, born 25th April, bred by E. J. Pipon, jun., St. Lawrence, Jersey; s Oakland's Sailer (3859), d Oakland's Beauty (8659), s d Badier's Dandy (2612).

C.—DR. H. CORNER, Brook House, Southgate, N., whole, **Lord Stockwell**, born 20th May, bred by Lord Rothschild, Tring Park, Tring, Herts; s Stockwell (8718), d Monista's Lassie, s d Leda's Golden Lad (7568).—COL. DAVIS, Salt Hill, Slough, whole, **Scottish Lad**.—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Fairy King**, born 16th July; s Cricketer (8137), d Fairy of Tarsus (imported, Vol. xiv., p. 254), s d Lord Brookhill (6928).—THE DUKE OF HAMILTON AND BRANDON, Old Lodge, Salisbury, whole, **Uam Var**, born 22nd May, bred by L. Breban, St. Helier's, Jersey; s Combination (3744), d Greenhill's Buttercup (4183).—THE LORD POLTIMORE, Poltimore Park, Exeter, whole, **Oxford Lad**, born 6th December; s Violet's Lad (8752 J.H.B.), d Oxford Lavinia (Vol. xvi., p. 362), s d Lavinia's Lad (6611).

CLASS 93.—*Jersey Bull, calved in* 1908. [23 entries.]

I. (£10.)—A. POCOCK, Freegrove, Calne, Wilts, whole, **Prime Minister**, born 28th March; s Barrister (8424), d Brown Fancy (Vol. xix., p. 262), s d Golden Jolly (7518).

II. (£5.)—R. P. WHEADON, Ilminster, grey, **Minerva**, born 3rd April, bred by J. du Val, St. Peter's, Jersey; s Lucy's Champion (3731), d Miss Octavia (12323).

III. (£2.)—A. POCOCK, whole, **Barrister's Valentine**, born 14th February; s Barrister (8424), d Landlady (Vol. xv., p. 325), s d Eminent 2nd (6546).

R. & V.H.C.—W. M. CAZALET, Fairlawne, Tonbridge, whole, **Felix**, born 28th May; s Oaklands Glory (9370), d Fideles (F.S.C.).

V.H.C.—LORD ROTHSCHILD, Tring Park, Tring, Herts, whole, **Elderberry's Lord**, born 19th February, bred by P. C. Mourant, St. Helier, Jersey; s Combination (8845), d Elderberry (11461).

H.C.—THE LORD POLTIMORE, Poltimore Park, Exeter, whole, **Distinction's Noble**, born 4th April, bred by H. Bendell, St. Martin's, Jersey; s Noble of Oaklands (3909), d Distinction's Queen (11732).—LADY SMYTH, Ashton Court, Bristol, whole, **Bobbie**, born 7th April; s Halberton's Bob (9268), d Lucilla (Vol. xvii., 344), s d Bessie's Knight (6781).—CAPTAIN J. E. P. SPICER, Spye Park, Chippenham, whole, **Lord Chambord**, born 12th July; s Lord Aldan (3985), d Astor's Chambord, s d Astor's Boy (3529).

C.—LADY DE ROTHSCHILD, Aston Clinton, Tring, whole, **Goldfinder**, born 4th May; s Trojan, d Golfina 2nd (Vol. xviii., p. 311), s d Arbitrator (7084).—J. M. F. FULLER, M.P., Jaggards, Corsham, whole, **Lord Chancellor**, born 21st March; s Barrister (8424), d Lady Everton (Vol. xvii., p. 330), s d Royal

Sovereign (7685).—LORD ROTHSCHILD, whole, **Molly's Sultan,** born 17th May, bred by E. G. Starch, Trinity, Jersey; s Campanile's Sultan (4000), d Molly Bawn 2nd (9720).—J. H. SMITH-BARRY, Stowell Park, Pewsey, Wilts, brown and white, **Moth,** born 3rd April; s Fleur de Lys, d Nab, s d Gay Boy (7510).—LADY SMYTH, whole, **Ashton Noble,** born 7th May; s Noble of Oaklands (9366), d Octavia (Vol. xix., p. 377, imported), s d Successor (7378 J.H.B.).—CAPT. J. E. P. SPICER, nearly whole, **Sheriff Safety,** born 2nd August; s Sheriff, d Welcome's Safety, s d Campanile's Welcome.

GUERNSEY.

CLASS 94.—*Guernsey Cow, in-Milk, calved before* 1906. [7 entries.]

I. (**£10**) and Special*—SIR E. A. HAMBRO, Hayes Place, Kent, fawn, **Hayes Olive,** born 8th June, 1903; s Merry Anton, d Olive Branch.

II. (**£5.**)—LADY TICHBORNE, Tichborne Park, Alresford, Hants, fawn and much white, **Itchen Pearl 2nd** (6187), born 29th March, 1904; s Rival (1343), d Itchen Pearl (5156), s d May Day (1132).

III. (**£2.**)—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, orange, fawn and white, **Elfordleigh Jewel,** born 20th May, 1904; s Elfordleigh Lad (1372), d Elfordleigh Janet (4422), s d Brixham Beau (866).

R. & V.H.C.—MRS. R. C. BAINGRIDGE, orange and white, **Elfordleigh Judy,** born 7th March, 1903; s Roman Emperor (1419), d Jane (3770), s d Sauteur.

H.C.—HON. A. B. HAMILTON, Burley Lodge, Ringwood, Hants, fawn and white, **Violet of Les Quartiers 3rd,** born 1st July, 1903; s Loyalist 2nd (1319 E.G.H.B.), d Violet of Les Quartiers (5025 E.G.H.B.).—W. T. RICHARDS, Godolphin, Breage, Cornwall, red and white, **Godolphin Phyllis 2nd,** born 10th May, 1905; s Squire of the Hunguets, d Godolphin Phyllis, s d Beauty of Village.

CLASS 95.—*Guernsey Heifer, in-Milk, calved in* 1906. [3 entries.]

I. (**£10.**)—C. F. DIXON, Rownham's Farm, near Southampton, fawn and white, **Rownham's Glorissa,** born 7th January; s Rowland of Seaview 4th (1519), d Rose of the Spurs 4th (4079 P.S.), s d Lord Orbid (1058 P.S.R.G.H.B.).

II. (**£5.**)—W. PENROSE, Trequean, Breage, Cornwall, fawn and white, **Fanny Du Foulon 19th,** born 3rd June, bred by J. Le Page, Hill Farm, St. Andrew's, Guernsey; s Desdoma's Masher (1694 P.S.R.G.A.S.), d Fanny du Toulon 12th (4651 P.S.R.G.A.S.),

R. & H.C.—W. T. RICHARDS, Godolphin, Breage, Cornwall, red and little white, **Godolphin Phyllis 3rd,** born 15th April; s Squire of the Hunguets, d Godolphin Phyllis, s d Beauty of Village.

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* Given by the English Guernsey Cattle Society, a Champion Cup, value £5, for the best Guernsey Cow or Heifer, bred in England, and entered in the E.G.C.S. Herd Book.

Class 96.—*Guernsey Heifer, calved in* 1907. [7 entries.]

I. (**£10**) and **R.** for Special*—Lady Tichborne, Tichborne Park, Alresford, Hants, dark fawn and white, **Itchen Pearl 6th** (7314), born 30th January; s Golden Secret (1569), d Itchen Pearl (5156), s d May Day (1132).

II. (**£5.**)—W. J. Empson, Merton Grange, Gamlingay, Cambs, red and white, **Merton Princess 3rd** (Vol. xxv.), born 26th May, bred by C. S. Payne, Blunham House, Sandy, Beds.; s Independent (1755), d Willingborough Lilac (4321).

III. (**£2.**)—Fowler & de la Perrelle, Porter's Lane, Southampton, red and white, **Jane of the Coutel Simon** (7493 G.H.B.), born 16th May, bred by W. Le Page, Guernsey; s Sir Reginald (1783 G.H.B.), d Victory 8th (2699 G.H.B.).

R. & H.C.—Fowler & de la Perrelle, brown and white, **Beauty Mills 2nd** (7487 G.H.B.), born 13th May, bred by A. Tostevin, Guernsey; s Governor of the Chene (1297 G.H.B.), d Beauty Mills (2944 G.H.B.).

C.—W. T. Richards, Godolphin, Breage, Cornwall, yellow, white star, **Lily of the Mount,** born 14th July, bred by the late Lord St. Levan, St. Michael's Mount, Marazion, Cornwall; s Godolphin Arthur, d Godolphin Phyllis, s d Squire of the Hunguets.

Class 97.—*Guernsey Heifer, calved in* 1908. [11 entries.]

I. (**£10.**)—Lady Tichborne, Tichborne Park, Alresford, Hants, dark fawn and white, **Itchen Tea Rose** (7700), born 20th July; s Raymond of the Preel 2nd (1877 P.S.), d Itchen Red Rose (7696).

II. (**£5.**)—W. Penrose, Trequean, Breage, Cornwall, fawn and white, **Trequean Fanny,** born 9th May; s Duke Sequel (1925), d Fanny Du Toulon 19th (7255).

III. (**£2.**)—Hon. A. B. Hamilton, Burley Lodge, Ringwood, Hants, fawn and white, **Rosemary 8th,** born 14th February; s Deputy of the Quartiers 2nd (1818 R.G.H.B.), d Rosemary 4th (4974 E.G.H.B.).

R. & V.H.C.—Sir E. A. Hambro, Hayes Place, Kent, fawn and white, **Hayes Golden Cherry 6th,** born 10th July; s Itchen Royal, d Hayes Golden Cherry 4th.

H.C.—W. J. Empson, Merton Grange, Gamlingay, Cambs., red and white, **Merton May Paradox 2nd** (Vol. xxv.), born 4th May, bred by F. Hargreaves, Friz Hill, Walton, Warwick; s Merton Signet (1691), d May Paradox 5th (5217), s d Smilax (1041 P.S.R.G.A.S.).—H. F. Plumptre, Goodnestone, near Dover, fawn and white, **Topsy of Goodnestone,** born 20th January; s Fleur-de-Lys (1565), d Topsy of Seagrove (6019), s d Roland of Seaview 2nd (1243).

C.—G. Blight, Tregonning, Breage, Helston, Cornwall, yellow and white, **Tregonning Darling,** born 2nd June; s Tregonning King (1792), d Darling (1224), s d Romulus.—W. Maddick, South Wonford, Heavitree, Exeter, yellow and much white, **Miss Evelyn 12th,** born 22nd April; s Pride (1775 E.G.H.B.), d Miss Evelyn 4th (3499 E.G.H.B.), s d Necklace 2nd (712 E.G.H.B.)

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* Given by the English Guernsey Cattle Society, a Champion Cup, value £5, for the best Guernsey Cow or Heifer, bred in England, and entered in the E.G.C S. Herd Book.

CLASS 98.—*Guernsey Bull, calved in* 1905 *or* 1906. [3 entries.]

I. (£10.)—SIR E. A. HAMBRO, Hayes Place, Kent, fawn and white, **Hayes Coronation 2nd,** born 12th August, 1906 ; s Coronation King, d Hayes Express.

II. (£5.)—T. R. BOLITHO, Trengwainton, Madron, Cornwall, red and white, **Trengwainton Village Lad** (1991), born 16th May, 1906, bred by F. Hargreaves, Merton, Gamlingay ; s Golden Noble (1524 P.S.R.G.A.S.), d Topsy of the Village (7002 P.S.R.G.A.S.)., s d William Rufus (1377 P.S.R.G.A.S.).

R. & H.C.—W. PENROSE, Trequean, Breage, Cornwall, red, **King of the Vaugrat,** born 23rd November, 1905, bred by T. H. Laine, Guernsey ; s King of the Meadow (1431), d Quicksilver 13th (5398).

CLASS 99.—*Guernsey Bull, calved in* 1907. [6 entries.]

I. (£10.)—SIR E. A. HAMBRO, Hayes Place, Kent, fawn and white, **Hayes Coronation 3rd,** born 26th June ; s Coronation King, d Hayes Olive.

II. (£5.)—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, orange and white, **Bijou's Sequel,** born 16th January ; s Plucky (1700), d Bijou of the Spurs (6072), s d Duke of the Blicqs (1200 P.S.).

III. (£2.)—W. T. RICHARDS, Godolphin, Breage, Cornwall, lemon and white, **Golden Hero of the Vauxbelets** (1995), born 12th February, bred by J. Hunault, Les Vauxbelets, St. Andrew's, Guernsey ; s Golden Hero of L'Etiennerie (1507 P.S.R.G.A.S.), d Lady of the Vauxbelets (5820 P.S.R.G.A.S.).

R. & V.H.C.—H. F. PLUMPTRE, Goodnestone, near Dover, fawn and white, **Golden Noble** (1930), born 15th April, bred by J. Le Page, Guernsey ; s Royal Governor of L'Etiennerie (1484 P.S.), d Dairy Maid 1st of the Briquet (5194 P.S.), s d King Edward (1291 P.S.).

H.C.—W. J. EMPSON, Merton Grange, Camlingay, Cambs., red and white, **Merton Signet 3rd** (1969), born 21st July, bred by F. Hargreaves, Friz Hill, Walton, Warwick ; s Merton Signet (1691), d Merton Lady (5223), s d Shamrock of the Gele (1254 P.S.R.G.A.S.).

C.—MRS. R. C. BAINBRIDGE, orange and white, **Charmant 1st,** born 18th March ; s Coronation King 4th, d Charmante 9th of the Gron.

CLASS 100.—*Guernsey Bull, calved in* 1908. [12 entries.]

I. (£10.)—T. R. BOLITHO, Trengwainton, Madron, Cornwall, red and white, **Village Favourite,** born 23rd April ; s Trengwainton Village Lad (1991 E.G.H.B.), d Wild Eyes (E.G.H.B.), s d Trengwainton King (1793 E.G.H.B.).

II. (£5.)—THE HON. H. P. GORE-LANGTON, Hatch Park, Taunton, Somerset, fawn with very little white, **Beauchamp Dorando,** born 1st May ; s Earl of Hardwicke (424), d Beauchamp Bramble (5374 E.G.H.B.), s d Beauchamp Laura (3970).

III. (£2.)—SIR E. A. HAMBRO, Hayes Place, Kent, fawn and white, **Hayes Royal 3rd,** born 25th July ; s Itchen Royal, d Hayes Olive 4th.

R. & H.C.—W. J. EMPSON, Merton Grange, Gamlingay, Cambs, fawn and white, **Merton Golden Noble** (Vol. xxv.), born 3rd March, bred by J. Le Page, Le Briquet, St. Saviour's, Guernsey ; s Golden Noble 2nd (1836 P.S.), d Sea Belle 7th (4444 P.S.).

H.C.—H. F. PLUMPTRE, Goodnestone, near Dover, fawn and white, **Fleur-de-Lys 2nd,** born 25th February; s Fleaur-de-Lys (1565), d May Wort 4th (6247), s d Broomflower (1446).

C.—T. R. BOLITHO, orange and white, **Trengwainton Acorn**, born 14th May, bred by E. A. Hambro, Hayes, Kent; s Itchen Royal (1756), d Hayes Olive (5838), s d Merry Anton.—THE EARL OF MOUNT EDGCUMBE, Cotehele House, St. Dominick, red and white, **Cotehele Duke**, born 10th December; s Knight of the Vauxbelets (1851 E.J.H.B.), d Cotehele Flora (5765 E.J.H.B.).

KERRY.

CLASS 101.—*Kerry Cow or Heifer, in-Milk, calved in or before* 1906. [4 entries.]

I. (**£10**) and **R.** for Special*—LADY GREENALL, Walton Hall, Warrington, **Walton Bashful** (871), born 1904, bred by the late E. J. Butler, Waterville.

II. (**£5.**)—T. WAITE, Highlands, Redhill, Surrey, **La Mancha Mary Ann** (ear mark 441), born 1900.

R.—J. L. TILLOTSON, Stanton Farm, Bebington, Cheshire, **Morna 13th** (3414 R.D.S.), born 2nd July, 1905, bred by G. G. Mahoney, Kilmorna, Co. Kerry; s Gort Sheen (475 R.D.S.), d Morna 12th (3251 R.D.S.).

V.H.C.—J. L. TILLOTSON, **Christmas Number** (541 H.B.), born 25th December, 1901, bred by G. L. Palmer, Lackham, Wilts; s Bobs (98), d Mollig Dhubh (493), s d Sir Aidh Ruadh (275).

CLASS 102.—*Kerry Heifer, calved in* 1907 *or* 1908. [5 entries.]

I. (**£10.**)—T. WAITE, Highlands, Redhill, Surrey, **Mangerton Sheila** (ear mark 857), born 1907.

II. (**£5.**)—LADY GREENALL, Walton Hall, Warrington, **Walton Bashful 3rd** (1044), born 1st March, 1907; s Walton Topazolite (168), d Walton Bashful (871).

R.—J. L. TILLOTSON, Stanton Farm, Bebington, Cheshire, **Bebington Rosebud**, born 5th January, 1908; s Kilmorna Lord (580 H.B.), d Sheen 12th (3258 R.D.S.).

V.H.C.—J. L. TILLOTSON, **Bebington Beauty** (ear mark 869), born 1907.

C.—J. E. WARD, Red Lodge, Purton, Wilts, **Attington Rhododendron** (1133), born 25th February, 1907, bred by A. Deverell, Attington House, Tetsworth, Oxon.

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* Given by B. de Bertodano, Esq., for the best Animal in Class 101, 102 or 103, to which the Cup had not previously been awarded. The Bertodano Challenge Cup, value 25 guineas. The Cup to become the property of an Exhibitor winning it three years in succession.

CLASS 103.—*Kerry Bull, calved in* 1906, 1907 *or* 1908. [5 entries.]

I. (**£10**) and Special*—J. L. TILLOTSON, Stanton Farm, Bebington, Cheshire, **Kilmorna Lord 3rd** (620 H.B.), born 16th April, 1906, bred by G. G. Mahoney, Kilmorna, Ireland ; s Kilmorna Lord (580 H.B.), d Sheen 12th (3258 H.B.).

II. (**£5.**)—LADY GREENALL, Walton Hall, Warrington, **Walton Acme** (198), born 8th May, 1907 ; s Walton Rajah (153), d Aicme Cold (510).

R.—J. L. TILLOTSON, **Melcho** (648 H.B.), born 26th April, 1907, bred by Mrs. Madden, Nutely, Ireland ; s Diver (603 H.B.), d Morna 7th (3246 H.B.)

H.C.—T. WAITE, Highlands, Redhill, **Lackham Puzzler**, born 7th December, 1907 ; s G. L. Palmer, Lackham, Lacock, Wilts ; s Lackham Count (161), d Abbeyleix Lady Clonbrooke (160), s d Waterville Knight (53).—J. E. WARD, Red Lodge, Purton, Wilts, **Black Starlight** (213), born 7th June, 1908 ; s Lackham Pride, d Black Lackham (1021), s d Lackham Count (161).

DEXTER KERRY.

CLASS 104.—*Dexter Kerry Cow or Heifer, in-Milk, calved in or before* 1906. [9 entries.]

I. (**£10.**)—H.M. THE KING, Sandringham, black, **Compton Daphne** (1067), born 1900.

II. (**£5.**)—B. DE BERTODANO, Cowbridge House, Malmesbury, Wilts, **Cowbridge Darling** (1262 H.B.), born March, 1904.

III. (**£2.**)—W. STALLARD, St. John's House, Worcester, black, **Malvern Diana** (1517), born 3rd June, 1905, bred by the Earl of Plymouth, Hewell, Worcestershire ; s Malvern Swell (364), d Malvern Chase (326), s d King of the Roses (Vol. iv., p. 37, R.D.S.).

R.—H. M. GIBBS, Barrow Court, Flax Bourton, Somerset, black, **Barrow Gunga**, born 1901.

H.C.—H. M. GIBBS, black, **Barrow Bee**, born 1903.

CLASS 105.—*Dexter Kerry Heifer, calved in* 1907 *or* 1908. [10 entries.]

I. (**£10**) and Special†—G. HABGOOD, Harley Lodge, Wimborne, Dorset, black, **Harley Coy**, born 11th May, 1907 ; s Kingwood Comely Boy (264), d Harley Signorina (1145), s d Great Malvern (178).

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* Given by B. de Bertodano, Esq., for the best Animal in Class 101, 102 or 103, to which the Cup had not previously been awarded. The Bertodano Challenge Cup, value 25 guineas. The Cup to become the property of an Exhibitor winning it three years in succession.

† Given by the English Kerry and Dexter Cattle Society, the Devonshire Challenge Cup, for the best animal in Classes 104 to 107, bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.

II. (**£5.**)—H. M. Gibbs, Barrow Court, Flax Bourton, Somerset, black, **Barrow Duchess 3rd,** born 1st June, 1907 ; s Brockhampton Count (255), d Barrow Duchess 2nd (1297), s d Compton Dan (213).

III. (**£2.**)—G. Habgood, black, **Harley Cocoa Nut,** born 25th May, 1907 ; s Kingwood Comely Boy (264), d Harley Nancy (1224), s d De Wet (147).

R.—B. de Bertodano, Cowbridge House, Malmesbury, Wilts, black, **Compton Doris 2nd** (1644 Vol. x.), born 4th January, 1907, bred by the Duchess of Devonshire, Compton Place, Eastbourne ; s Compton Dante (287 H.B.), d Compton Doris, s d Sprucefield Little Rex (311 H.B.).

V.H.C.—H.M. The King, Sandringham, black, **Lady Sweetheart,** born 1st February, 1908 ; s King John, d Sweetheart.

C.—B. de Bertodano, black, **Cowbridge Mitzi** (Vol. x.), born 29th May, 1907 ; s Cowbridge Rufus (290 H.B.), d Cowbridge Dainty Girl (1214 H.B.), s d Cowbridge Cupid (291 H.B.).—Mrs. Leatham, The Manor, Bagendon, Cirencester, black, **Saucy Girl,** born 13th January, 1907 ; s Jack Tar, d Malvern Signature, s d Grandaddy.

Class 106.—*Dexter Kerry Bull, calved in* 1906, 1907 *or* 1908. [10 entries.]

I. (**£10.**)—B. de Bertodano, Cowbridge House, Malmesbury, Wilts, black, **Cowbridge General** (385 Vol. x.), born 25th March, 1906, bred by G. Courtney, Kenmare, Co. Kerry, Ireland ; s Kenmare George (471 R.D.S.), d Kenmare May (2132 R.D.S.).

II. (**£5**) and **R.** for Special*—H. M. Gibbs, Barrow Court, Flax Bourton, Somerset, black, **Barrow Captain,** born 7th July, 1907 ; s Brockhampton Count (255), d Barrow Agnes 2nd (1343), s d Compton Dan (213).

III. (**£2.**)—H.M. The King, Sandringham, black, **Compton Dago,** born 27th July, 1907, bred by the Duchess of Devonshire, Compton, Eastbourne ; s Compton Dante (287), d Compton Dark Beauty.

R.—Mrs. Leatham, The Manor, Bagendon, Cirencester, black, **Lucky Penny,** born 29th July, 1907 ; s Good Luck, d Bonnie Isabel.

H.C.—H. M. Gibbs, black, **Barrow Desmond,** born 14th December, 1907 ; s Barrow Dan Bahadur (328), d Barrow Tava (1908 R.D.S.).—Mrs. Leatham, red, **Prosperity,** born 2nd July, 1907 ; s Good Luck, d Patsy, s d Malvern Sweep.

(The Prizes in Class 107 were given by the English Kerry and Dexter Cattle Society.)

Class 107.—*Dexter Kerry Bull, calved in* 1908, *whose sire and dam were entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book.* [4 entries.]

I. (**£10.**)—Mrs. Leatham, The Manor, Bagendon, Cirencester, black, **Surefoot,** born 5th January ; s Jack Tar, d Malvern Signature, s d Grandaddy.

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* Given by the English Kerry and Dexter Cattle Society, the Devonshire Challenge Cup, for the best animal in Classes 104 to 107, bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.

II. (£6.)—B. DE BERTODANO, Cowbridge House, Malmesbury, Wilts, black, **Cowbridge Snow Boy** (404 Vol. x.), born 18th January, 1908; s Cowbridge Xit (291 H.B.), d La Mancha Snowdrop (871 H.B.).

R.—H. M. GIBBS, Barrow Court, near Bristol, red, **Barrow Battle Axe,** born 7th June; s Malvern Toper (306), d Barrow Bee (1335).

H.C.—H. M. GIBBS, black, **Barrow Tomtit,** born 16th June; s Malvern Toper (306), d Barrow Seeta (1907 R.D.S.).

DAIRY.

(The Prizes in Class 108 were given by the Devon Cattle Breeders' Society.)

CLASS 108.—*Pedigree Dairy Cow, in-Milk, entered in or eligible for Davy's Devon Herd Book, yielding the largest quantity of Milk of normal character, containing at each time of milking* 12 *per cent. of total solids of which not less than* 3 *per cent. shall be fat, the period of lactation being taken into consideration.* [6 entries.]

I. (**£10.**)—J. H. CHICK, Wynford Eagle, Dorchester, Dorset, **Charmer,** bred by T. S. Stevens, Littlewindsor, Manor Farm, Dorset; s Chilfrome Pretty Boy (3399), d by Doctor Primrose (2573), (Last calf 20th January, 1909).

II. (**£5.**)—M. J. KIDNER, Fennington, Kingston, Taunton, **Dorothy Lass,** born 6th March, 1902, bred by W. Kidner, Stoke Holy Cross, Norwich; s Hestercombe May Day (4214), d Dorothy 4th (17617), s d Councillor (3407). (Last calf 26th March, 1909).

III. (**£2.**)—W. D. CHICK, Compton Valence, Dorchester, **Compton Lady 2nd** (16121), born 5th February, 1895, bred by the late J. Chick, Compton Valence, Dorchester; s Sunset (3061), d Compton Lark (10603), s d Chevithorne (1697). (Last calf 25th March, 1909).

R.—T. S. MORGAN, Whimple, Exeter, Devon, **Colley 19th** (19425), born 27th November, 1900, bred by R. W. C. Evered, Spaxton, Bridgwater, Somerset; s Nobleman 2nd (3637), d Colley 16th (15662), s d Tregothnan.

CLASS 109.—*Cow, in-Milk, of any breed or cross, under* 900 *lbs. live weight, yielding the largest quantity of milk, of normal character, containing at each time of milking* 12 *per cent. of total solids, of which not less than* 3 *per cent. shall be fat, the period of lactation being taken into consideration.*

I. (**£10.**)—J. H. SMITH-BARRY, Stowell Park, Pewsey, Wilts, fawn, Jersey, **Caprice,** born 28th July, 1905; s Oxford Sunbeam (8650), d Captious, s d Geonnais Lad (6562). (Last calf 16th December, 1908).

II. (**£5.**)—J. H. SMITH-BARRY, brown Jersey, **Flanders Girl,** born 7th January, bred by M. A'Court, St. Ouen's, Jersey; s Halloween's Fox (8917), d Lady de Flandre 3rd, s d Joe (4891). (Last calf 18th March, 1909).

III. (£2.)—Lady Smyth, Ashton Court, Bristol, whole Jersey, **Walcombe Starstone** (Vol. xv., p. 408), born 13th June, 1901, bred by — Arney, Draycot; s Turquoise (6737), d Starstone (Vol. xi., p. 327). (Last calf 1st January, 1909).

R.—Lord Rothschild, Tring Park, Tring, Herts, broken Jersey, **Triangle 2nd,** born 13th December, 1905, bred by J. Barette, St. Mary's, Jersey; s Mourier King (7940), d Triangle (9579).

Class 110.—*Cow, in-Milk, of any breed or cross,* 900 *lbs. live weight or over, yielding the largest quantity of milk of normal character, containing at each time of milking* 12 *per cent. of total solids, of which not less than* 3 *per cent. shall be fat, the period of lactation being taken into consideration.*

I. (£10.)—J. Evens, Burton, near Lincoln, Lincoln Red Shorthorn, born 1902.

II. (£5.)—W. P. Vosper, Merafield, Plympton, South Devon, red South Devon, **Cowslip 5th** (4691), born 28th February, 1901; s Prince Edward (517), d Cowslip 2nd (2686), s d Duke of Devon 2nd (171). (Last calf 2nd March, 1909.)

III. (£2.)—W. P. Vosper, red South Devon, **Victoria** (5145), born 8th October, 1902; s Drummer (975), d Primula 2nd (3937), s d Prince Edward (917). (Last calf 3rd March, 1909).

R.—T. Cundy, Devonshire Dairy, 25, Benbow Street, Stoke, Devonport, red South Devon, **Iris 2nd,** born 17th July, 1900; s Rentpayer, d Dairymaid

BUTTER TEST.

(The Prizes in Classes 111 and 112 were given by the English Jersey Cattle Society for a Three Days' Butter Test, and entries in them were subject to any conditions issued by that Society previous to the tests.

Class 111.—*Cow of any breed or cross, under* 900 *lbs. live weight, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Jersey Cattle Society.*

I. (£20) and Gold Medal*—J. H. Smith-Barry, Stowell Park, Pewsey, Wilts, fawn Jersey, **Caprice,** born 28th July, 1905; s Oxford Sunbeam (8650), d Captious, s d Geonnais Lad (6562). (Last calf 16th December, 1908.)

II. (£12) and Bronze Medal*—Lady Smyth, Ashton Court, Bristol, whole Jersey, **Walcombe Starstone** (Vol. xv., p. 408), born 13th June, 1901, bred by — Arney, Draycot; s Turquoise (6737). d Starstone (Vol. xi., p. 327). (Last calf, 1st January, 1909.)

III. (£8.)—A Pocock, Freegrove, Calne, Wilts, whole Jersey, **Landlady** (Vol. xv., p. 325), born 1st February, 1903, bred by J. P. Pirouet, St. Lawrence, Jersey; s Eminent 2nd (6546), d Greenhill Buttercup 3rd (4183), s d Prince of L'Alva (4981). (Last calf 1st February, 1909).

IV. (**£5.**)—J. H. Smith-Barry, brown Jersey, **Flanders Girl**, born 7th January, bred by M. A'court, St. Ouen's, Jersey; s Halloween's Fox (8917), d Lady de Flandre 3rd, s d Joe (4891).

V. (**£3.**)—Lord Rothschild, Tring Park, Tring, Herts, broken Jersey, **Triangle 2nd**, born 13th December, 1905, bred by J. Barette, St. Mary's, Jersey; s Mourier King (7910), d Triangle (9579).

Class 112.—*Cow, of any breed or cross,* 900 *lbs. live weight or over, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Jersey Cattle Society.*

I. (**£20.**)—J. Evens, Burton, near Lincoln, Lincoln Red Shorthorn, born 1902.

II. (**£12**) and Silver Medal*—Lady de Rothschild, Aston Clinton, Tring, whole Jersey, **Lady Phyllis**, born 12th March, 1902, bred by E. G. Renouf, St. Martin's; s Tormentor (7685), d Poppy's Violet (8953 R.S.C.). (Last calf 11th March, 1908.)

III. (**£8.**)—W. P. Vosper, Merafield, Plympton, South Devon, red South Devon, **Cowslip 5th** (4691), born 28th February, 1901; s Prince Edward (517), d Cowslip 2nd (2686), s d Duke of Devon 2nd (171). (Last calf, 2nd March, 1909).

IV. (**£5.**)—Col. C. H. E. Coote, Highgate House, Creaton, Northampton, fawn Jersey, **Wench**, born 6th May, 1899, bred by P. Le Couillard, Grouville, Jersey; s Rook (7011), d Ladylike (6782), s d Fauvette's Boy (4838). (Last calf 12th January, 1909).

V. (**£3.**)—W. P. Vosper, red South Devon, **Victoria** (5145), born 8th October, 1902; s Drummer (975), d Primula 2nd (3937), s d Prince Edward (517). (Last calf 3rd March, 1909).

VI. (**£2.**)—W. and H. Whitley, Primley Farm, Paignton, Devon, **Peeper** (3370), born 26th May, 1898, bred by G. L. Bond, Buckland Barton, Newton Abbott; s Happy Boy 2nd (608), d Buckland Peeper (2129), s d Gudgeon (182),

H.C.—J. Evens, Lincoln Red Shorthorn, born 1903. (Last calf 18th March. 1909).—G. Ll. Palmer, Lackham, Lacock, Wilts, red Lincoln Red Shorthorn, **Bracebridge** (62 B.), born 18th March, 1905, bred by F. Scorer, Nettleham Lodge, Lincoln; s Bracebridge Boothby (2770), d Bracebridge (118), s d Bracebridge Prince Charming (1788). (Last calf 15th February, 1908).

Certificates of Merit.—Dr. H. Watney, Buckhold, Pangbourne, whole Jersey, **Wild Tansey**, born 6th February, 1904; s Lord Guenon 2nd (7906), d Wild Teasel 2nd, s d Mariette's Guenon (6325). (Last calf 26th December, 1908).—Dr. H. Watney, whole Jersey, **Maples Lavanja**, born 28th August, 1904; s Maple's Aurelius (8277), d Guenon's Lavanja, s d Mariette's Guenon (6315). (Last calf 17th February, 1909).—Dr. H. Watney, grey, **Red Maple**, born 14th July, 1896; s Savoy (5720), d Golden Maple, s d Egyptian (4535). (Last calf 26th October, 1908).

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* Gold, Silver and Bronze Medals were given for the three Jersey Cows, entered or eligible for entry in the English Jersey Herd Book, obtaining the greatest number of points in the test, and Certificates of Merit were granted to Jersey Cows, not being Prize-winners, entered or eligible for entry in the Herd Book, reaching the E.J.C.S. Standard of Merit.

SHEEP.

COTSWOLD.

Class 113.—*Cotswold Shearling Ram.* [6 entries.]

I. (**£10.**)—W. T. Garne & Son, Aldsworth, Northleach, R.S.O., Gloucester, born February.

II. (**£5.**)—W. Houlton, Broadfield Farm, Northleach, Gloucester, born January.

III. (**£2.**)—W. Houlton, born January.

R.—W. T. Garne & Son, born February.

H.C.—J. Fowler, Aston, Avening, Stroud, born 9th March, 1908.

C.—J. Fowler, born 2nd February, 1908.

Class 114.—*Pair of Cotswold Ram Lambs, dropped in* 1909. [5 entries.]

I. (**£10.**)—W. T. Garne & Son, Aldsworth, Northleach, R.S.O., Gloucester, born about 20th January.

II. (**£5.**)—W. T. Garne & Son, born about 28th January.

R.—W. Houlton, Broadfield Farm, Northleach, Gloucester, born January.

H.C.—J. Fowler, Aston, Avening, Stroud, born 3rd February.

C.—J. Fowler, born 21st February.

Class 115.—*Pen of three Cotswold Shearling Ewes.* [6 entries.]

I. (**£10.**)—W. Houlton, Broadfield Farm, Northleach, Gloucester, born January and February, 1908.

II. (**£5.**)—W. T. Garne & Son, Aldsworth, Northleach, R.S.O., Gloucester, born February, 1908.

III. (**£2.**)—W. Houlton, born January and February, 1908.

R.—W. T. Garne & Son, born February, 1908.

V.H.C.—J. Fowler, Aston, Avening, Stroud, born 17th February.—J. Fowler, born 21st February.

DEVON LONG-WOOL.

Class 116.—*Devon Long-Wool Shearling Ram.* [12 entries.]

I. (**£10.**)—F. White, Torweston, Williton, Somerset, born February, 1908.

II. (**£5.**)—F. White, born February, 1908.

III. (**£2.**)—R. Cook, Crazelowman, Tiverton, Devon, born February, 1908.

R.—F. White, born February, 1908.

H.C.—W. Brent, Clampit, Callington, Cornwall, born February, 1908.

C.—R. Cook, born February, 1908.

Class 117.—*Pair of Devon Long-Wool Ram Lambs, dropped in* 1909. [8 entries.]

I. (**£10.**)—F. White, Torweston, Williton, Somerset, born January.

II. (**£5.**)—F. White, born February.

III. (**£2.**)—W. Brent, Clampit, Callington, Cornwall, born January.

R.—F. White, born January.

Class 118.—*Pen of three Devon Long-Wool Shearling Ewes.* [4 entries.]

I. (**£10.**)—R. Cook, Crazelowman, Tiverton, born February, 1908.

II. (**£5.**)—F. White, Torweston, Williton, Somerset, born February, 1908.

R.—R. Cook, born February, 1908.

V.H.C.—F. White, born February, 1908.

SOUTH DEVON.

Class 119.—*South Devon Shearling Ram.* [12 entries.]

I. (**£10.**)—F. J. Wintle, Keynedon Barton, Kingsbridge, born February, 1908.

II. (**£5.**)—F. J. Wintle, born February, 1908.

III. (**£2.**)—P. G. Brown, Tremadart, Duloe, Cornwall, born 20th February.

R.—J. S. Hallett, Sherford, Brixton, Plymouth, born February, 1908.

V.H.C.—P. G. Brown, born 22nd February, 1908.

H.C.—J. Stooke, Sherford, Brixton, Plymouth, born February, 1908.

C.—R. B. Trant, Tregrill, Menheniot, Cornwall, born about 1st week in February, 1908.

Class 120.—*Pair of South Devon Ram Lambs, dropped in* 1909. [5 entries.]

I. (**£10.**)—J. S. Hallett, Sherford, Brixton, Plymouth, born 22nd January.

II. (**£5.**)—J. Stooke, Sherford, Brixton, Plymouth, born February.

R.—J. S. Hallett, born last week in January and 1st week in February.

Class 121.—*Pen of three South Devon Shearling Ewes.* [2 entries.]

I. (**£10.**)—J. Stooke, Sherford, Brixton, Plymouth, born February, 1908.

R.—J. Stooke, born February, 1908.

SOUTHDOWN.

(The Prizes in Class 122 were given by the Southdown Sheep Society).

Class 122.—*Southdown Two Shear Ram.* [12 entries.]

I. (**£10**) and Special*—The Duke of Richmond and Gordon, K.G., Goodwood, Chichester, born 14th February, 1907.

II. (**£5.**)—Sir J. Wernher, Bart., Luton Hoo, Luton, Beds., born about 1st February, 1907.

III. (**£2.**)—C. R. W. Adeane, Babraham Hall, Cambridge, born about 1st February, 1907.

R.—J. R. West, Alscot Park, Stratford-on-Avon, born February, 1907, bred by the late Duke of Devonshire, Compton, Eastbourne.

V.H.C.—D. H. B. McCalmont, Crockford's Farm, Newmarket, born March, 1907, bred by Executors of Col. McCalmont, Cheveley.

Class 123.—*Southdown Shearling Ram.* [16 entries.]

I. (**£10**) and **R.** for Special*—D. H. B. McCalmont, Crockford's Farm, New market, born March, 1908, bred by the Executors of Col. McCalmont, Cheveley-

II. (**£5.**)—Sir J. Wernher, Bart., Luton Hoo, Luton, Beds, born about 1st February, 1908.

III. (**£2.**)—C. R. W. Adeane, Babraham Hall, Cambridge, born about 1st February, 1908.

R.—Sir J. Colman, Bart., Gatton Park, Surrey, born February, 1908.

V.H.C.—C. R. W. Adeane, born about 1st February, 1908.—The Duke of Richmond and Gordon, K.G., Goodwood, Chichester, born 12th February, 1908.

H.C.—C. R. W. Adeane, born about 1st February, 1908.

Class 124.—*Pair of Southdown Ram Lambs, dropped in* 1909. [7 entries.]

I. (**£10.**)—D. H. B. McCalmont, Crockford's Farm, Newmarket, born 27th February.

II. (**£5.**)—H.M. The King, Sandringham, born February.

III. (**£2.**)—C. R. W. Adeane, Babraham Hall, Cambridge, born about 1st February.

R.—J. R. West, Alscot Park, Stratford-on-Avon, born March.

V.H.C.—Sir J. Wernher, Bart., Luton Hoo, Luton, Beds., born about 14th February.

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* Given by the Southdown Sheep Society, under Condition 69, a Silver Medal or £1 for the best Ram or Ram Lamb in Class 122, 123 or 124.

CLASS 125.—*Pen of three Southdown Shearling Ewes.* [5 entries.]

I. (£10.)—SIR J. COLMAN, Bart., Gatton Park, Surrey, born February, 1908.

II. (£5.)—H.M. THE KING, Sandringham, born February, 1908.

R.—SIR J. WERNHER, Bart., Luton Hoo, Luton, Beds., born about 1st February, 1908.

H.C.—VISCOUNT PORTMAN, Bryanston, Blandford, born January, 1908.

HAMPSHIRE DOWN.

CLASS 126.—*Hampshire Down Shearling Ram.* [5 entries.]

I. (£10.)—J. FLOWER, Chilmark, Salisbury, born January, 1908.

II. (£5.)—C. COLES, Manor House, Winterbourne Stoke, Salisbury, born 20th January, 1908.

R.—HON. MRS. PLEYDELL-BOUVERIE, Coleshill House, Highworth, Wilts, born January, 1908, bred by the late Hon. D. Pleydell Bouverie.

CLASS 127.—*Pair of Hampshire Down Ram Lambs, dropped in* 1909. [5 entries.]

I. (£10.)—D. NICOLL, Burntwood, Martyr Worthy, Winchester, born January.

II. (£5.)—J. FLOWER, Chilmark, Salisbury, born in January.

R.—C. COLES, Manor House, Winterbourne Stoke, Salisbury, born 20th January.

CLASS 128.—*Pen of three Hampshire Down Shearling Ewes.* [4 entries.]

I. (£10.)—J. FLOWER, Chilmark, Salisbury, born in January, 1908.

II. (£5.)—C. COLES, Manor House, Winterbourne Stoke, Salisbury, born 20th January, 1908.

R.—D. NICOLL, Burntwood, Martyr Worthy, Winchester, born January, 1908.

(The Prizes in Class 129 were given by the Hampshire Down Sheep Breeders' Association).

CLASS 129.—*Pen of three Hampshire Down Ewe Lambs, dropped in* 1909. [5 entries.]

I. (£7.)—C. COLES, Manor House, Winterbourne Stoke, Salisbury, born 20th January.

II. (£3.)—D. NICOLL, Burntwood, Martyr Worthy, Winchester, born January.

R.—THE HON. MRS. PLEYDELL-BOUVERIE, Coleshill House, Highworth, Wilts, born January, bred by the late Hon. D. Pleydell-Bouverie.

H.C.—J. FLOWER, Chilmark, Salisbury, born January.

SHROPSHIRE.

Class 130.—*Shropshire Shearling Ram.* [11 entries.]

I. (**£10.**)—F. Bibby, Hardwicke Grange, Shrewsbury, born March, 1908.

II. (**£5.**)—M. Williams, Whiston Hall, Albrighton, Wolverhampton, born about middle of February, 1908.

III. (**£2.**)—M. Williams, born about middle of February, 1908.

R.—Sir R. Cooper, Bart., Ashlyns Hall, Berkhamsted, born 23rd February, 1908.

H.C.—Sir R. Cooper, Bart., born 27th February, 1908.

C.—J. J. Brewin, Whitehouse, Barnston, near Birkenhead, born March, 1908.

Class 131.—*Pair of Shropshire Ram Lambs, dropped in* 1909. [6 entries.]

I. (**£10.**)—M. Williams, Whiston Hall, Albrighton, Wolverhampton, born about middle of January.

II. (**£5.**)—Sir R. Cooper, Bart., Ashlyns Hall, Berkhamsted, born 5th February.

III. (**£2.**)—Sir R. Cooper, Bart., born 4th February.

R.—A. N. Henderson, Street Aston House, Lutterworth, born early in February.

Class 132.—*Pen of three Shropshire Shearling Ewes.* [5 entries.]

I. (**£10.**)—Sir R. Cooper, Bart., Ashlyns Hall, Berkhamsted, born about 1st March, 1908.

II. (**£5.**)—Sir R. Cooper, Bart., born about 1st March, 1908.

R.—F. Bibby, Hardwicke Grange, Shrewsbury, born March, 1908.

V.H.C.—F. Bibby, born March, 1908.

OXFORD DOWN.

Class 133.—*Oxford Down Shearling Ram.* [8 entries.]

I. (**£10.**)—J. T. Hobbs, Maisey Hampton, Fairford, Gloucester, born middle of January, 1908.

II. (**£5.**)—A. Brassey, M.F.H., Heythrop Park, Chipping Norton, born 12th January, 1908.

III. (**£2.**)—J. T. Hobbs, born middle of January, 1908.

R.—J. Horlick, Cowley Manor, near Cheltenham, Gloucester, born January, 1908.

V.H.C.—A. Brassey, M.F.H., born 11th January, 1908.—J. Horlick, born January, 1908.

C.—J. T. Hobbs, born middle of January, 1908.

Class 134.—*Pair of Oxford Down Ram Lambs, dropped in* 1909. [2 entries.]

I. (£10.)—J. T. Hobbs, Maisey Hampton, Fairford, Gloucester, born middle of January.

R. & H.C.—J. Horlick, Cowley Manor, near Cheltenham, Gloucester, born January.

Class 135.—*Pen of three Oxford Down Shearling Ewes.* [5 entries.]

I. (£10.)—J. T. Hobbs, Maisey Hampton, Fairford, Gloucester, born middle of January, 1908.

II. (£5.)—J. T. Hobbs, born middle of January, 1908.

R. & V.H.C.—A. Brassey, M.F.H., Heythrop Park, Chipping Norton, born beginning of January, 1908.

H.C.—J. Horlick, Cowley Manor, near Cheltenham, born January, 1908.

(The Prizes in Class 136 were given by the Oxford Down Sheep Breeders' Association and were withheld until the Animals awarded the prizes were registered in the Flock Book.)

Class 136.—*Pair of Oxford Down Ewe Lambs, dropped in* 1909. [3 entries.]

I. (£6.)—J. T. Hobbs, Maisey Hampton, Fairford, Gloucester, born middle January.

II. (£3.)—J. Horlick, Cowley Manor, near Cheltenham, born January.

R. & H.C.—P. E. Frank, Fulbrook, Burford, Oxon, born 6th—12th February.

DORSET DOWN.

(The 1st Prizes in Classes 137 to 140 were given by the Dorset Down Sheep Breeders' Association).

Class 137.—*Dorset Down Shearling Ram.* [6 entries.]

I. (£10.)—Eden & Watson Purse Caundle, Sherborne, Dorset, born January, 1908.

II. (£5.)—Eden & Watson, born January, 1908.

III. (£2.)—G. C. Wood Homer, Bardolf Manor, Dorchester, born 24th January, 1908, bred by G. Wood Homer.

R.—G. Wood Homer, Bardolf Manor, Dorchester, born 3rd January, 1908.

H.C.—G. Wood Homer, born 23rd March, 1908.

Class 138.—*Pair of Dorset Down Ram Lambs, dropped in* 1909. [5 entries.]

I. (£10.)—J. E. Tory, East Farm, Whitechurch, Blandford, born 1st week of January.

II. (**£5.**)—Eden & Watson, Purse Caundle, Sherborne, Dorset, born January.

R.—J. E. Tory, born 2nd week of January.

H.C.—Eden & Watson, born January.

Class 139.—*Pen of three Dorset Down Shearling Ewes.* [4 entries.]

I. (**£10.**)—G. Wood Homer, Bardolf Manor, Dorchester, born 7th and 11th January, 1908.

II. (**£5.**)—J. E. Tory, East Farm, Whitechurch, Blandford, Dorset, born 3rd week in January, 1908.

R.—J. E. Tory, born 1st week of January, 1908.

H.C.—G. C. Wood Homer, Bardolf Manor, Dorchester, born 7th and 11th January, 1908, bred by G. Wood Homer.

Class 140.—*Pen of three Dorset Down Ewe Lambs, dropped in* 1909. [5 entries.]

I. (**£10.**)—Eden & Watson, Purse Caundle, Sherborne, Dorset, born January.

II. (**£5.**)—Eden & Watson, born January.

R.—G. C. Wood Homer, Bardolf Manor, Dorchester, born 14th and 15th January.

H.C.—J. E. Tory, East Farm, Whitechurch, Blandford, Dorset, born 2nd week in January.

EXMOOR HORN.

(The Prizes in Class 141 were given by the Exmoor Horn Sheep Breeders' Society).

Class 141.—*Exmoor Horn Ram, other than Shearling.* [6 entries.]

I. (**£5.**)—D. J. Tapp, Higher Combe, Dulverton, born 24th February, 1906 bred by Capt. Mildmay, Hollam, Dulverton.

II. (**£3.**)—W. Gammin, South Lydcott, High Bray, near South Molton, born 25th March, 1907.

III. (**£2.**)—T. C. Pearse, Leigh, Dulverton, Somerset, born March, 1906, bred by J. H. Pring, Withycombe, Winsford.

R.—D. N. Purchase, Bowchurch, Molland, South Molton, North Devon, born 1st March, 1907.

Class 142.—*Exmoor Horn Shearling Ram.* [9 entries.]

I. (**£10.**)—D. J. Tapp, Higher Combe, Dulverton, born 18th February, 1908.

II. (**£5.**)—J. Robins, Lidcot Hall, High Bray, South Molton, born March, 1908.

III. (**£2.**)—W. Lethbridge, Home Farm, Wood, Okehampton, born 27th March, 1908.

R.—W. Gammin, South Lydcott, High Bray, near South Molton, born 30th March, 1908.

Class 143.—*Pen of three Exmoor Horn Shearling Ewes.* [6 entries.]

I. (**£10.**)—W. Lethbridge, Home Farm, Wood, Okehampton, born March, 1908.

II. (**£5.**)—W. Gammin, South Lydcott, High Bray, near South Molton, born 28th March, 1908.

III. (**£2.**)—J. Robins, Lidcot Hall, High Bray, South Molton, born March, 1908.

R.—T. Lovelace, Bratton Court, Minehead, born March, 1908.

DORSET HORN.

Class 144.—*Dorset Horn Shearling Ram.* [5 entries.]

I. (**£10.**)—W. R. Flower, West Stafford, Dorchester, born 24th December, 1907.

II. (**£5.**)—Sir E. A. Hambro, Milton Abbey, Blandford, Dorset, born 10th November, 1907.

R.—W. R. Flower, born 22nd November, 1907.

V.H.C.—Sir E. A. Hambro, born 10th November, 1907.

H.C.—F. J. Merson, Farringdon, North Petherton, Bridgwater, born 1st week in December, 1907.

Class 145.—*Pair of Dorset Horn Ram Lambs, dropped after November* 1*st*, 1908. [5 entries.]

I. (**£10.**)—W. R. Flower, West Stafford, Dorchester, born 2nd December, 1908.

II. (**£5.**)—Sir E. A. Hambro, Milton Abbey, Blandford, Dorset, born 5th November, 1908.

R.—W. R. Flower, born 2nd December, 1908.

H.C.—Sir E. A. Hambro, born 5th November, 1908.

C.—F. J. Merson, Farringdon, North Petherton, born last week in November, 1908.

Class 146.—*Pen of three Dorset Horn Shearling Ewes.* [5 entries.]

I. (**£10.**)—W. R. Flower, West Stafford, Dorchester, born 22nd November, 1907.

II. (**£5.**)—Sir E. A. Hambro, Milton Abbey, Blandford, Dorset, born 10th November, 1907.

R.—W. R. Flower, born 22nd November, 1907.

V.H.C.—Sir E. A. Hambro, born 10th November, 1907.—F. J. Merson, Farringdon, North Petherton, Bridgwater, born 1st week in December, 1907.

DARTMOOR.

CLASS 147.—*Dartmoor Shearling Ram.* [9 entries.]

I. (£10.)—R. S. LUSCOMBE, Wisdome, Cornwood, born 10th March, 1908.

II. (£5.)—R. S. LUSCOMBE, born 5th March, 1908.

III. (£2.)—J. O. MUNTZ, Heathcot, Yelverton, born March, 1908.

R.—E. P. NORTHEY, Higher Bowden, Okehampton, born 19th March, 1908.

H.C.—E. P. NORTHEY, born March, 1908.—E. P. NORTHEY, born March, 1908.

CLASS 148.—*Pen of three Dartmoor Shearling Ewes.* [3 entries.]

I. (£10.)—W. ROWSE, Okehampton, born March, 1908.

II. (£5.)—J. SPRY, Trevenn Farm, Lamerton, Tavistock, bred by J. Beale, Challenger Farm, Tavistock.

H.C.—J. W. WESTAWAY, Whitestone, Marytavy, Devon, born about 20th March, 1908.

GOATS.

(The Prizes in Classes 149 to 154 were given by the British Goat Society.)

(N.B.—Goats marked with an asterick (*) had been milking Prize winners.)

CLASS 149.—*Male Goats (horned or hornless), any variety, over 1 year on May 31st, 1909.* [7 entries.]

I. (£1 10s.)—THE DUCHESS OF HAMILTON AND BRANDON, Old Lodge, Salisbury, **Sedgemere Princess** (H.B. 1364), Swiss, grey, born 12th April, 1905, bred by S. Woodiwiss ; s Sedgemere Paris (P.R.), d Sedgemere Faith (P.R.).

II. (£1.)—LADY ACLAND, Killerton, Exeter, **Bricket Togo** (H.B. 1283), Anglo-Nubian, buff with black markings, born 10th August, 1905, bred by B. Ravenscroft ; s Bricket Cross (P.R.), d Geisha Queen (1068).

III. (10s.)—LADY ACLAND, **Sedgemere Guide** (H.B. T 96), pure Toggenburg, fawn, born 17th March, 1905, bred by S. Woodiwiss ; s Sedgemere Paris, d Sedgemere Glinette*.

R.—LADY ACLAND, **Copthorne Monk** (H.B. 1596), Toggenburg, fawn, bore 20th April 1908, bred by Mrs. H. Spicer ; s Sedgemere Princeps, d Sedgemern Capella.*

CLASS 150.—*Male Kids (horned or hornless), any variety, not exceeding 12 months on 31st May, 1909.* [4 entries.]

I. (£1 10s.)—MISS ELSIE MORTIMER, Wigmore, Holmwood, Surrey, **Wigmore Jumbo** (K.R. 1624), Anglo-Nubian, black, born 5th February, 1909 ; s Barton Black Rock (1227), d Montbretia (960).

II. (**£1.**)—W. A. Wilcox Tally Ho! Lodge, Basingstoke, **Tally Ho! Tim** (K.R. 2643), born 1st March, 1909; s Sedgemere Fitzfaith†, d Folette.

III. (**10s.**)—The Lady Dunleath, Ballywater Park, Co. Down, Ireland, **Ballywalter Hawk** (K.R. 2624), Anglo-Nubian, brown, fawn and grey, born 4th February, 1909; s Grey Granite†, d Lark.

Class 151.—*Female Goats of any variety, prick-eared over 2 years old on 31st May.* [11 entries.]

I. (**£1 10s.**)—Lady Acland, Killerton, Exeter, **Killerton Opal** (H.B. 1369), Anglo-Nubian, fawn with black points, born 3rd April, 1906; s Marmora (799), d Freda (1181).

II. (**£1.**)—W. A. Wilcox, Tally Ho! Lodge, Basingstoke, **Rousette** (H.B. T198), pure Toggenburg, born March 17th, 1906; s Le Cerf (T163), d La Glinette (1171).

III. (**10s.**)—Mrs. Broomfield, Ampress, Lymington, **Nan,** spotted white and fawn, aged 4 years.

R—W. A. Wilcox, **Marmotte** (H.B. T197), pure Toggenburg, born 17th March, 1909, bred by W. Webster; s Le Cerf (T163), d La Glinette (1171).

V.H.C.—Lady Acland, **Killerton Pearl,** Anglo-Nubian, white, born 3rd March, 1905; s Marmora (H.B. 799), d Killerton Sprydon.

H.C.—The Lady Gertrude Crawford, Coxhill, Lymington, **Eastern Royal** (H.B. 1211), Anglo-Nubian-Toggenburg, fawn, born 30th December, 1904, bred by C. W. Smith; s Sedgemere Lucifer (1003), d Kona 2nd (964).

C.—The Lady A. Cecil, The Mount, Lymington, **Ruby,** Anglo-Nubian, red; d Honesty.

Class 152.—*Female Goats of any variety, having lop or drooping ears, over 2 years old, not eligible for Class 3.* [6 entries.]

I. (**£1 10s.**)—Miss E. Mortimer, Wigmore, Holmwood, Surrey, **Bricket Nora** (H.B. 1448), Anglo-Nubian, fawn, born 24th March, 1907, bred by B. Ravenscroft; s Bricket Cross (P.R.), d B. Tatters (1187).

II. (**£1.**)—The Lady Arthur Cecil, The Mount, Lymington, **Bricket Belladonna** (H.B. 1342), Anglo-Nubian, cream, born 20th March, 1906, bred by B. Ravenscroft; s Bricket Cup (1224), d Bricket Satwetta (1192).

III. (**10s.**)—Miss E. Mortimer, Wigmore, Holmwood, Surrey, **Wigmore Fancy** (H.B. 1567), Anglo-Nubian, brown, born 31st May, 1906, bred by Mrs. A. Perkins; s Bricket Bill Bailey (1199), d Nancy (1556).

R.—The Lady Arthur Cecil, **Nita,** Anglo-Nubian, fawn, born 26th March 1904, bred by Miss Hamilton; s Roselle Emperor (1313), d Nanna.

Class 153.—*Goatlings, any variety, not exceeding 2 years old.* [18 entries.]

I. (**£1 10s.**)—Miss M. Wilde, Little Gaddesden, Berkhampsted, Herts, **Bricket Lady Bird** (K.R. 2429), Anglo-Nubian, fawn, born 7th December, 1907, bred by B. Ravenscroft; s Bricket Bacchus, d Bricket Bee (1340).

II. (**£1.**)—Miss E. Mortimer, Wigmore, Holmwood, Surrey, **Bricket Tattle,** Anglo-Nubian, fawn, born 23rd January, 1908, bred by B. Ravenscroft; s Bricket Cross, d Bricket Tatters.

III. (**10s.**)—Miss E. Mortimer, **Bricket Tawdrey** (K.R. 2435), Anglo-Nubian, fawn and white, born 23rd January, 1908, bred by B. Ravenscroft; s Bricket Cross, d Bricket Tatters (1187).

R.—The Lady A. Cecil, The Mount, Lymington, **Forest Montana** (K.R. 2485), Anglo-Nubian, roan, born 6th March, 1908; s Broom Squire (1405), d Bricket Morphia (1343).

V.H.C.—The Lady Gertrude Crawford, Coxhill, Lymington, **Bricket Mole** (K.R. 2424), Anglo-Nubian, cream and white, born 12th January, 1908, bred by B. Ravenscroft; s Bricket Cross (P.R.), d Bricket Olga (1191).

C.—The Lady Gertrude Crawford, **Bricket Daffodil** (K.R. 2427), Anglo-Nubian, red and white, born 18th January, 1908, bred by B. Ravenscroft; s Bricket Cross, d Daffy (1091).

Class 154.—*Milking Class, for she goats of any variety.* [12 entries.]

The Prizes in this Class were awarded for quantity only, according to period of lactation, and without reference to quality, nor to the size, breed, or appearance of the animal. Points were given as under:—

For each 1lb of milk, 1 point;

For every 60 days that the Goat has been in milk since the birth of its last kids, with a maximum of 400 days, 1 point.

No award was made where a less weight than 2½lb was given in three milkings.

I. (**£1 10s.**) and Special*—Lady Acland, Killerton, Exeter, **Killerton Opal** (H.B. 1369), Anglo-Nubian, fawn with back points, born 3rd April, 1906; s Marmora (799), d Freda (1181). (Last kidded 14th April).

II. (**£1.**)—Lady Acland, **Killerton Pearl,** Anglo-Nubian, white, born 3rd March, 1905; s Marmora (H.B. 799), d Killerton Sprydon. (Last kidded 7th March, 1909).

III. (**10s.**)—Miss E. Mortimer, Wigmore, Holmwood, Surrey, **Wigmore Fancy** (H.B. 1567), Anglo-Nubian, brown, born 31st May, 1906, bred by Mrs. A. Perkins; s Bricket Bill Bailey (1199), d Nancy (1556). (Last kidded 26th May, 1908).

R.—W. A. Wilcox, Tally Ho! Lodge, Basingstoke, **Rousette** (H.B. T198), pure Toggenburg, born March 17th, 1906; s Le Cerf (T163), d La Glinette (1171). (Last kidded February 14th, 1909).

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* The Silver Medal of the British Goat Society for the Goat winning the greatest number of points in the Milking and Inspection Classes combined.

PIGS.

BERKSHIRE.

Class 155.—*Berkshire Boar, farrowed in* 1906, 1907 *or* 1908. [6 entries.]

I. (£7) and **R.** for Special*—J. Horton, Fern Hill, Moseley, Birmingham, **Moseley Admiral,** born 6th June, 1908 ; s Admiral Togo, d Lass of Moseley, s d Wig Wag Augustus.

II. (£3.)—H. Peacock, Greatford Hall, Stamford, **Polegate Donohue** (13135), born 27th January, 1907, bred by the Duchess of Devonshire, Eastbourne ; s Harold H (10238), d Polegate Dulce (9817), s d Cecil Augustus (7756).

III. (£2.)—E. J. Morant, Brockenhurst Park, Hants, **Hayward Hero** (13506), born 17th June, 1907 ; s Hayward Hightide (13188), d Ethel M (13185), s d High Quality (8299).

R.—D. E. Higham, Coombelands, Addlestone, Surrey, **Ongar Leader** (13641), born 6th December, 1907 ; s Ongar Hotspur (12072), d Manor Luxury (10557), s d Lord Alfred (8039).

Class 156.—*Pair of Berkshire Boars, farrowed in* 1909. [3 entries.]

I. (£5.)—J. A. Fricker, Suddon Grange, Wincanton, born 3rd January ; s Fightable F.B. (11246), d Suddon Belinda (12994), s d Hightide F.B. (9373).

II. (£2)—L. Currie, Minley Manor, Farnborough, Hants, born 18th January ; s Minley General (13477), d Queen of Minley (13461), s d Simpleton (11428).

R.—H. Peacock, Greatford Hall, Stamford, born 2nd January ; s Victor Rex (13990), d Warwick Daisy (14019), s d Highmoor Tory (11037).

Class 157.—*Berkshire Breeding Sow, farrowed before* 1909. [9 entries.]

I. (£7) and Special*—H. Peacock, Greatford Hall, Stamford, **Warwick Lady** (14020), born 2nd March, 1908, bred by R. B. Vincent, Compton Valence ; s Crown Prince 5th (13160), d Compton Dark Daisy (12270), s d Supreme's Boy (9723).

II. (£3.)—J. A. Fricker, Suddon Grange, Wincanton, **Freebody** (12042), born 22nd April, 1905 ; s Hightide F.B. (9373), d Freewoman (10080), s d Marlborough (8942).

III. (£2.)—E. J. Morant, Brockenhurst Park, Hants, **Hayward Haybag 4th** (13511), born 1st August, 1907 ; s Hayward Mikado (13189), d Hayward Haybag 2nd (13193), s d Hayward Hightide (13188).

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* Given by the British Berkshire Society, for the best Boar or Sow in the Berkshire Classes entered in, or eligible for the Herd Book, whose Sire and Dam, together with the name of its Breeder, were entered in the Catalogue.

R.—LORD ALINGTON, Crichel, Wimborne, **Crichel Beauty 2nd,** born 12th January, 1907 ; s Okeford Edward (10777), d Lady Nathaniel, s d Goldfinder (10088).

V.H.C.—D. E. HIGHAM, Coombelands, Addlestone, Surrey, **Motcombe Lady** (10558), born 1st November, 1902, bred by N. Benjafield, Motcombe, Dorset ; s Baron Kitchener (8463), d Compton Princess (8402), s d Gold Medalist (6061). —J. HORTON, Fern Hill, Moseley, Birmingham, **Incola,** born 4th April, 1907, bred by R. W. Hudson, Danesfield ; s Okeford Emperor, d Danesfield Holyrood, s d Pietermaritzberg.

C.—L. CURRIE, Minley Manor, Farnborough, Hants, **Minley Star** (13446), born 1st June, 1907 ; s Minley Brier (11302), d Bramble (9616), s d Danesfield Commons (8246).

CLASS 158.—*Pair of Berkshire Breeding Sows, farrowed in* 1909. [3 entries.]

I. (£5.)—L. CURRIE, Minley Manor, Farnborough, Hants, born 18th January ; s Minley General (13477), d Queen of Minley (13461), s d Simpleton (11428).

II. (£2.)—H. PEACOCK, Greatford Hall, Stamford, born 2nd January ; s Victor Rex (13990), d Warwick Daisy (14019), s d Highmoor Tory (11037).

R.—J. A. FRICKER, Suddon Grange, Wincanton, born 4th January ; s Fightable F.B. (11246), d Suddon Peggy (12996), s d Hightide F.B. (9373).

LARGE BLACK.

CLASS 159.—*Large Black Boar, farrowed in* 1906, 1907, *or* 1908. [9 entries.]

I. (£7.)—H. PERRY, Old Heazille, Rewe, near Exeter, born 1st July, 1907, bred by S. Adams, Bosoha Sithney, Helstone, Cornwall ; s Bosoha Champion (2133), d Trevisquite Topsy (5754).

II. (£3.)—J. H. GLOVER, The Inn, Cornwood, **Cornwood Earl** (2189 Vol. ix.), born 1st September, 1906 ; s Cornwood King (1467), d Cornwood Lass 13th (3714), s d Cornwood Marquis (633).

III. (£2.)—T. F. HOOLEY, Papworth-Everard, near Cambridge, **Henley Achilles** (1999), born 10th September, 1906, bred by H. Sessions, Wootton Manor, Henley-on-Thames ; s Iford Squire 2nd (1369), d Ifton Darkie (4832), s d Lord Roberts 2nd (553).

R.—J. O. MUNTZ, Heathcot, Yelverton, **Goodameavy Matador** (2595), born 27th July, 1907 ; s Goodameavy Triumph (1717), d Goodameavy Violet (5784), s d Goodemeavy Cavalier (1341).

CLASS 160.—*Pair of Large Black Boars, farrowed in* 1909. [9 entries.]

I. (£5.)—T. WARNE, Trevisquite Manor, St. Mabyn, S.O., Cornwall, born 6th January, bred by — Johns, Cleave, Lifton, Devon ; s Cleave Rentpayer (2163), d Cleave Alpha (5138), s d Trevisquite Confidence (1203).

II. (**£2.**)—J. C. Olver, Woodland Valley, Ladock, Grampound Road, born 17th January; s Prior of the Valley (2737), d Beauty of the Valley 6th, s d Brent Chief (1243).

III. (**£1.**)—T. Warne, born 6th January, bred by — Johns, Cleave, Lifton, Devon; s Cleave Rentpayer (2163), d Cleave Alpha (5138), s d Trevisquite Cofidence (1203).

R.—J. Warne, Treveglos, St. Mabyn, R.S.O., Cornwall, born 14th January; s Trescowe Bongo (2205), d Treveglos Lass 2nd (6220), s d Trevisquite Confidence (1203).

Class 161.—*Large Black Breeding Sow, farrowed before* 1909. [15 entries.]

I. (**£7.**)—H. J. Kingwell, Great Aish, South Brent, Devon, **Brent Souvenir**, born 3rd June, 1908; s Whalesborough Chief (717), d Brent Sunflower (5004), s d Trescowe Pride (875).

II. (**£3.**)—T. F. Hooley, Papworth-Everard, near Cambridge, **Drayton Diadem 4th** (7680), born 1st October, 1907; s Henley Achilles (1999), d Stroud Missie 3rd (6498), s d Borstal Masterpiece (841).

III. (**£2.**)—T. F. Hooley, **Drayton Diadem 1st** (7674), born 1st October, 1907; s Henley Achilles (1999), d Stroud Missie 3rd (6498), s d Borstal Masterpiece (841).

R.—T. F. Hooley, **Stroud Missie 3rd** (6498), born 21st July, 1906, bred by W. Townsend, The Manse, Stroud, Gloucester; s Borstal Masterpiece (841), d Cirencester Missie (4128), s d Hasketon Black Boy (609).

(The Prizes in Class 162 were given by the Large Black Pig Society.)

Class 162.—*Large Black Breeding Sow, not exceeding* 12 *months old prior to May* 1*st*, 1909. [10 entries.]

I. (**£7.**)—H. J. Kingwell, Great Aish, South Brent, Devon, **Brent Souvenir**, born 3rd June, 1908; s Whalesborough Chief (717), d Brent Sunflower (5004), s d Trescowe Pride (875).

II. (**£3.**)—H. J. Kingwell, **Brent Songstress**, born 3rd June, 1908; s Whalesborough Chief, (717), d Brent Sunflower (5004), s d Trescowe Pride (875).

III. (**£2.**)—T. F. Hooley, Papworth-Everard, near Cambridge, **Drayton Dancer 1st** (8134), born 17th July, 1908; s Henley Achilles (1999), d Stroud Wonder 6th (6486), s d Borstal Masterpiece (841).

R.—J. C. Olver, Woodland Valley, Ladock, Grampound Road, **Model of the Valley 3rd**, born 1st June, 1908; s Bill Bailey, d Model of the Valley 2nd (8052), s d Goodameavy Cyclone (1183).

Class 163.—*Pair of Large Black Breeding Sows, farrowed in* 1909. [10 entries.]

I. (**£5.**)—W. and H. Whitley, Primley Farm, Paignton, South Devon, born 3rd January; s Brent Happy Boy (2219), d Brent Pretty Polly (5680), s d Trescowe Pride (875).

II. (**£2.**)—T. Warne, Trevisquite Manor, St. Mabyn, S.O., Cornwall, born 6th January, bred by — Johns, Cleave, Lifton, Devon; s Cleave Rentpayer (2163), d Cleave Alpha (5138), s d Trevisquite Confidence (1203).

III. (**£1.**)—H. Wardlaw, Holway Farm, Sherborne, Dorset, born 7th January; s Hinton King of Spades (2141), d Cornwood Lass 25th (7074), s d Goodameavy Triumph (1717).

R.—J. Warne, Treveglos, St. Mabyn, R.S.O., born 15th January, bred by T. Warne, Trevisquite, St. Mabyn; s Trevisquite Eclipse (2403), d Trevisquite Content 4th (6934), s d Trevisquite Confidence (1203),

LARGE WHITE.

Class 164.—*Large White Boar, farrowed in* 1906, 1907 *or* 1908. [4 entries.]

I. (**£7**) and Special*—Earl of Ellesmere, Worsley Hall, Manchester **Worsley Turk 4th** (11217), born 1st January, 1907; s Bottesford Worsley (9015), d Molly of Worsley (19122), s d Ruddington Eclipse (8713).

II. (**£3.**)—C. Spencer, Holywell Manor, St. Ives, Hunts, **Holywell Day Boy 2nd** (10865), born 29th August, 1906, bred by S. Spencer & Son, Holywell Manor; s Holywell Cyack (8607), d Holywell Day Girl 2nd (15794), s d Holywell John Day (6409).

R.—Sir G. Greenall, Bart., Walton Hall, Warrington, **Walton King 8th** (10177), born 10th March, 1906; s Walton King 5th (8785), d Walton Betty 4th (14700), s d Pride of Erin (6533).

Class 165.—*Pair of Large White Boars, farrowed in* 1909. [6 entries.]

I. (**£5.**)—Earl of Ellesmere, Worsley Hall, Manchester, born 3rd January; s Emperor of Worsley (10791), d Worsley Empress 6th (19762), s d Ruddington Monarch (6037).

II. (**£2.**)—T. R. Bolitho, Trengwainton, Madron, Cornwall, born 4th January; s Worsley Topper of Rosevidney, d Worsley Perfection, s d Duke of York (5935).

R.—E. J. Morant, Brockenhurst Park, Hants, born 1st January; s Holywell Derby B (9905), d Snowdrop 4th (21588), s d Slade Ranger (11071).

Class 166.—*Large White Breeding Sow, farrowed before* 1909. [5 entries.]

I. (**£7**) and **R.** for Special*—Earl of Ellesmere, Worsley Hall, Manchester, **Dame Worsley 39th** (15650), born 4th January, 1904; s Duke of York 4th (5935), d Dame Worsley 31st (13952), s d Borrowfield Eclipse (5427).

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* Given by the National Pig Breeders' Association, three Gold Medals, value £3 3s. each (or £3 3s. in money), for the best Animal of each breed exhibited in the Large White, Middle White, or Tamworth Classes, entered in or eligible for the Herd Book, and the names and numbers of whose sire and dam appeared in the Catalogue.

II. (**£3.**)—Sir G. Greenall, Bart., Walton Hall, Warrington, **Walton Lady Alice 23rd** (19692), born 3rd January, 1906; s Walton Jerry 2nd (8777), d Walton Lady Alice 7th (14730), s d Walton What's Wanted 5th (7277).

R.—E. J. Morant, Brockenhurst Park, Hants, **Slade Snowdrop 5th,** born 4th July, 1907; s Holywell Derby B (9905), d Snowdrop 4th (21588), s d Slade Ranger (11071).

Class 167.—*Pair of Large White Breeding Sows, farrowed in* 1909. [8 entries.]

I. (**£5.**)—Earl of Ellesmere, Worsley Hall, Manchester, born 2nd January; s Emperor of Worsley (10791), d Worsley Hawthorn 23rd (21846), s d Worsley Roger (8827).

II. (**£2.**)—Earl of Ellesmere, born 1st January; s Worsley Monarch 25th (11193), d Miss Russell Walker, s d Holywell Bourne (9161).

III. (**£1.**)—T. R. Bolitho, Trengwainton, Madron, Cornwall, born 4th January; s Worsley Topper of Rosevidney, d Worsley Perfection, s d Duke of York (5935).

R.—Sir G. Greenall, Bart., Walton Hall, Warrington, born 17th January; s Walton King 8th (10171), d Caroline 3rd (18274), s d Ruddington Chieftain 2nd (10077).

H.C.—G. Blight, Tregonning, Breage, Helston, Cornwall, **Tregonning Perfection 7th** and **8th,** born 7th January; s King Edward (11763), d Tregonning Perfection (23688), s d Ruddington Monarch (6073).

MIDDLE WHITE.

Class 168.—*Middle White Boar, farrowed in* 1906, 1907 *or* 1908. [3 entries.]

I. (**£7**) and Special*—C. Spencer, Holywell Manor, St. Ives, Hunts, **Holywell Victor Chief** (11283), born 3rd August, 1906, bred by S. Spencer & Son, Holywell Manor; s Holywell Rosario (8857), d Holywell Victoria Countess (13298), s d Holywell Count (3239).

II. (**£3.**)—Sir G. Greenall, Bart., Walton Hall, Warrington, **Southampton Prince** (10317), born 1st August, 1906, bred by A. Brown, Hill Farm, Southampton; s Southampton King (8877), d Islington Champion Queen (15064), s d Walton Dainty (6753).

R.—H. Peacock, Greatford Hall, Stamford, **Southampton Prince,** born 12th January, 1908, bred by A. Brown, Hill Farm Dairy, Southampton; s First Choice of Pendley (10277), d Holywell Rosadora 4th (19890), s d Holywell Viscount (8179).

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CLASS 169.—*Pair of Middle White Boars, farrowed in* 1909.
[1 entry.]

I. (**£5.**)—SIR G. GREENALL, Bart., Walton Hall, Warrington, born 17th January; s Walton Clumber 4th (9427), d Walton Rose 60th (20000), s d Walton Dainty 3rd (8201).

CLASS 170.—*Middle White Breeding Sow, farrowed before* 1909.
[5 entries.]

I. (**£7**) and **R.** for Special*—SIR G. GREENALL, Bart., Walton Hall, Warrington, **Walton Rose 56th** (19992), born 10th February, 1906; s Offley John (7395), d Walton Rose 22nd (15142), s d Walton Dainty (6753).

II. (**£3.**)—C. SPENCER, Holywell Manor, St. Ives, Hunts, **Holywell Victoria Plum**, born 8th July, 1907; s Holywell Rosario (8857), d Holywell Victoria Countess (13298), s d Holywell Count (3239).

R.—SIR G. GREENALL, Bart., **Walton Rose 64th** (22124), born 1st February, 1906; s Walton Rufus 2nd (9437), d Walton Rose 38th (17758), s d Offley John (7395).

C.—H. PEACOCK, Greatford Hall, Stamford, **Southampton Bluebell**, born 1st June, 1907, bred by A. Brown, Hill Farm Dairy, Southampton; s Walton Turret 8th (8231), d Islington Champion Queen (15064), s d Walton Dainty (6753).

CLASS 171.—*Pair of Middle White Breeding Sows, farrowed in* 1909.
[1 entry.]

I. (**£5.**)—SIR G. GREENALL, Bart., Walton Hall, Warrington, born 17th January; s Walton Clumber 4th (9427), d Walton Rose 60th (20000), s d Walton Dainty 3rd (8201).

TAMWORTH.

CLASS 172.—*Tamworth Boar, farrowed in* 1906, 1907 *or* 1908.
[6 entries.]

I. (**£7**) and Special*—O. C. H. RILEY, The Brainge, Putley, Ledbury, Herefordshire, **Monmouth 2nd** (11421), born 7th January, 1907, bred by R. Ibbotson, Knowle, Warwick; s Lydney Red Gauntlet (9517), d Knowle Mellor (17910), s d Knowle Duke of Melbourne (8949).

II. (**£3.**)—O. C. H. RILEY, **Croesus**, born 17th April, 1908; s Monmouth 2nd (11421), d Charlotte (22164), s d Charlie (11339).

III. (**£2.**)—E. J. MORANT, Brockenhurst Park, Hants, **Dilton Nonsuch**, born 3rd January, 1908; s Knowle Prince George (10413), d Dilton Esther (22180), s d Charlie (11339).

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* Given by the National Pig Breeders' Association, three Gold Medals, value £3 3s. each (or £3 3s. in money), for the best Animal of each breed, exhibited in the Large White, Middle White, or Tamworth Classes, entered in or eligible for the Herd Book, and the names and numbers of whose sire and dam appeared in the Catalogue.

R.—R. Ibbotson, The Hawthorns, Knowle, Birmingham, **Knowle Lord Cromer** (11385), born 10th July, 1907 ; s Knowle Don (10393), d Knowle Mellor (17910), s d Knowle Duke of Melbourne (8949).

Class 173.—*Pair of Tamworth Boars, farrowed in* 1909. [3 entries.]

I. (£5.)—O. C. H. Riley, The Brainge, Putley, Ledbury, Herefordshire, **Putley Conqueror** and **Putley Champion,** born 2nd January ; s Monmouth 2nd (11421), d Charlotte (22164), s d Charlie (12339).

II. (£2.)—R. Ibbotson, Knowle, Warwickshire, born 29th January, bred by Mrs. E. Ibbotson, Gun Hill, Arley, Warwickshire ; s Knowle Lord Cromer (11385), d Knowle Dewdrop 4th (22214), s d Lydney Red Gauntlet.

R.—R. Ibbotson, born 4th February, bred by Miss M. H. Ibbotson, Gun Hill, Arley, Warwickshire ; s Knowle Lord Cromer (11385), d Knowle Ruby (2258), s d Knowle King David (10405).

Class 174.—*Tamworth Breeding Sow, farrowed before* 1909. [5 entries.]

I. (£7) and **R.** for Special*—R. Ibbotson, The Hawthorns, Knowle, Birmingham, **Constance,** born 12th January, 1907, bred by Mrs. E. Ibbotson, Gun Hill, Arley, Warwickshire ; s Scarlet Gem (9553), d Gem of Gun Hill (20126), s d Whitacre Radium (8987).

II. (£3.)—R. Ibbotson, **Springfield,** born 10th January, 1908, bred by G. I. Eveson, Springfield Hall, Knowle, ; s Knowle Don (10393), d Knowle Gold Dust (20158), s d Knowle Lycidas (10427).

R.—E. de Hamel, Middleton Hall, Tamworth, **Middleton Morgorna** (20250), born 1st January, 1906 ; s Middleton Majestic (8971), d Middleton Megallie (16576), s d Middleton Mainspring (6825).

Class 175.—*Pair of Tamworth Breeding Sows, farrowed in* 1909. [5 entries.]

I. (£5.)—O. C. H. Riley, The Brainge, Putley, Ledbury, Herefordshire, **Putley Circe** and **Putley Celandine,** born 2nd January ; s Monmouth 2nd (11421), d Charlotte (22164), s d Charlie (11339).

II. (£2.)—E. de Hamel, Middleton Hall, Tamworth, born 4th January ; s Gay Lad of Middleton, d Middleton Microcosma, s d Middleton Majestic (8971).

R.—R. Ibbotson, Knowle, Warwickshire, born 29th January, bred by Mrs. E. Ibbotson, Gun Hill, Arley, Warwickshire ; s Knowle Lord Cromer (11385), d Knowle Dewdrop 4th (22214), s d Lydney Red Gauntlet.

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* Given by the National Pig Breeders' Association, three Gold Medals, value £3 3s. each (or £3. 3s. in money), for the best Animal of each breed exhibited in the Large White, Middle White or Tamworth Classes, entered in or eligible for the Herd Book, and the names and numbers of whose sire and dam appeared in the Catalogue.

PRODUCE.

CIDER.

(Open to Growers or Makers).

First Prize in each of the Classes 176 *to* 178, *a Gold Medal and a Certificate.*

Second Prize ditto, a Silver Medal and a Certificate.

Third Prize ditto, a Bronze Medal and a Certificate.

CLASS 176.—*Cask of not less than* 18 *and not more than* 30 *gallons of Cider, made in* 1908. [21 entries.]

I.—W. T. S. TILLEY.

II.—W. T. S. TILLEY.

III.—D. J. CROFTS & SON.

R.—RIDLER & SON.

V.H.C.—C. DART.

H.C.—F. H. EVANS & SON.

C.—D. J. CROFTS & SON.—H. J. DAVIS.

CLASS 177.—12 *Bottles of Cider, made in* 1908. [33 entries.]

I.—QUANTOCK VALE CO.

II.—QUANTOCK VALE CO.

III.—RIDLER & SON.

R.—W. T. S. TILLEY.

V.H.C.—W. T. S. TILLEY.

H.C.—W. T. S. TILLEY.

C.—C. DART.—RIDLER & SON.

CLASS 178.—12 *Bottles of Cider, made in any year previous to* 1908. [7 entries.]

I.—RIDLER & SON.

II.—T. STONE.

III.—D. J. CROFTS & SON.

R.—H. THOMSON & CO.

(The competition in Classes 179 and 180 was confined to *bona fide* Tenant Farmers who had never taken a first prize at any public exhibition).

CLASS 179.—*Cask of not less than* 18 *and not more than* 30 *gallons of Cider made in* 1908. [1 entry.]

First Prize, Silver Medal. Second Prize, Bronze Medal.

[NO AWARD.]

CLASS 180.—12 *Bottles of Cider made in* 1908.

First Prize, Silver Medal. Second Prize, Bronze Medal.

[1 entry.]

II.—E. WELLINGTON.

CHEESE.

CLASS 181.—3 *Cheddar Cheeses* (*not less than* 56 *lbs. each*), *made in* 1908. [19 entries.]

I. (**£15.**)—T. C. CANDY.

II. (**£10.**)—F. PORTCH.

III. (**£5.**)—H. BRAKE.

IV. (**£3.**)—S. WHITE.

R.—E. BRAKE.

C.—F. W. J. CROCKER.—A. H. W. OSBORNE.—G. D. TEMPLEMAN.

CLASS 182.—3 *Cheddar Cheeses* (*not over* 56 *lbs. each*), *made in* 1908. [12 entries.]

I. (**£8.**)—T. C. CANDY.

II. (**£5.**)—F. PORTCH.

III. (**£3.**)—A. WHITE.

R.—J. SAGE.

C.—JOSEPH CANDY.—G. D. TEMPLEMAN.

(The Prize in Class 183 was given by the Somerset Agricultural Instruction Committee).

CLASS 183.—3 *Cheddar Cheeses* (*not less than* 28 *lbs. each*), *of any age, made by a student who had received instruction in the Somerset County Council or the Western Counties Cheese School.* [1 entry.]

II. (**£3.**)—G. D. TEMPLEMAN.

Class 184.—3 *Single Gloucester or Wilts Cheeses made in* 1909. [9 entries.]

I. (**£6.**)—G. D. Templeman.

II. (**£4.**)—J. Sage.

III. (**£2.**)—W. Salmon.

R.—R. J. Jesse.

C.—G. Tucker.

Class 185.—8 *Loaf or other Truckle Cheeses, made in* 1908. [11 entries.]

I. (**£5.**)—Joseph Candy.

II. (**£3.**)—N. J. Sims.

III. (**£2.**)—T. C. Candy.

R.—H. H. Pickford.

C.—A. H. W. Osborne.

Class 186.—3 *Caerphilly Cheeses, made in* 1909. [9 entries.]

I. (**£3.**)—E. A. Austin.

II. (**£2.**)—Wilts United Dairies.

III. (**£1.**)—J. C. Adlam.

R.—G. E. Prideaux.

C.—E. Dibble.—C. and G. Prideaux.

CREAM CHEESE, BUTTER AND CREAM.

(These Classes were not open to Professional Teachers).

Class 187.—3 *Cream or other Soft Cheeses.* [12 entries.]

I. (**£3.**)—Mrs. C. M. McIntosh.

II. (**£2.**)—Glynde Creameries.

III. (**£1.**)—Miss M. G. Prideaux.

R.—E. Vaughan.

H.C.—Mrs. R. C. Bainbridge.—Medway Dairy.

C.—H. R. White.

Class 188.—3 *lbs. of Fresh (or very slightly salted) Butter.* [40 entries.]

I. (**£4.**)—Earl of Mount Edgcumbe.

I. (**£4.**)—Mrs. F. Ward.

II. (**£3.**)—Mrs. C. M. McIntosh.

II. (**£3.**)—Mrs. J. H. Phillips.

III. (**£2.**)—Mrs. A. A. Bere.

III. (**£2.**)—C. E. Keyser.

IV. (**£1.**)—W. F. Merry.

IV. (**£1.**)—E. Vaughan.

R.—Mrs. L. R. Mildon.

V.H.C.—Mrs. E. Lewis.

H.C.—Sir G. Cooper, Bart.—Mrs. E. Langhorne.—Miss E. A. Peek.—W. T. Richards.—C. Whicher.

C.—W. Knatchbull.—Miss S. Page.—Baron Van Haeften.—Mrs. M. C. Williams.

Class 189.—3 *lbs. of Fresh (or very slightly salted) Butter, made from scalded cream.* [30 entries.]

I. (**£4.**)—Mrs. F. Ward.

II. (**£3.**)—Mrs. L. R. Mildon.

III. (**£2.**)—Mrs. E. Langhorne.

IV. (**£1.**)—Mrs. J. H. Phillips.

R.—Miss A. Dodd.

V.H.C.—W. T. Richards.—E. Vaughan.

H.C.—A. H. Gibbs.—W. Knatchbull.—Mrs. C. M. McIntosh.—W. F. Merry.—Mrs. A. Morrison.—Miss S. Page.—Viscount Portman.—Mrs. J. Way.—Mrs. M. C. Williams.

C.—Mrs. R. C. Bainbridge.—Mrs. A. A. Bere.

Class 190.—3 *lbs. of Butter to which no salt whatever had been added, judged on the last day of the Show.* [24 entries.]

I. (**£4.**)—Viscount Portman.

II. (**£3.**)—Mrs. F. Ward.

III. (**£2.**)—Mrs. L. R. Mildon.

IV. (**£1.**)—A. H. Gibbs.

R.—Mrs. A. A. Bere.

H.C.—Earl of Mount Edgcumbe.—Miss E. A. Peek.—Mrs. J. H. Phillips.—Mrs. M. C. Williams.

Class 191.—*Not less than* 12 *lbs. of Fresh Butter, packed for transit.* [4 entries.]

I. (**£3.**)—Mrs. C. M. McIntosh.

II. (**£1 10s.**)—Exe Valley Dairies.

R.—Shandon Dairy Co.

CLASS 192.—*12 lbs. of Keeping Butter, in a jar or crock, delivered to the Secretary 4 weeks before the Show.* [11 entries.]

I. (£4.)—MRS. L. R. MILDON.

II. (£3.)—MRS. C. M. MCINTOSH.

III. (£2.)—MRS. E. LEWIS.

R.—R. B. VINCENT.

C.—J. CHANNON.—MISS E. G. COOK.—MISS S. PAGE.

CLASS 193.—*4 Half pounds of Scalded Cream.* [26 entries.]

I. (£3.)—MRS. L. R. MILDON.

II. (£2.)—MISS A. DODD.

III. (£1.)—MRS. J. H. PHILLIPS.

IV. (10s.)—F. AND H. HORNBY.

R.—G. E. PRIDEAUX.

V.H.C.—CATHEDRAL DAIRY CO.

H.C.—J. DOLBEAR.—A. H. GIBBS.—F. AND H. HORNBY.—MRS. A. MORRISON.—G. LL. PALMER.—HON. MRS. JERVOISE SMITH.

C.—C. AND G. PRIDEAUX.

COMPETITIONS.

BUTTER-MAKING.

(No winner of a first prize given by this Society for Butter-making during the last three years was eligible to compete in Classes 194 to 196.)

CLASS 194.—*For first year Students who had been through a course of instruction in Butter-making at any County Council School since the Society's last Show. On the first day of Show.* [8 entries.]

I. (£4.)—MISS M. D. SEAGER.

II. (£3.)—MISS A. CLEVERDON.

III. (£1 10s.)—MISS D. A. HOSKIN.

R.—MISS M. C. BLAMEY.

C.—MISS N. HARVEY.—MISS M. HUNKING.—MISS F. M. STEPHENS.—MISS A. R. M. WISE.

Class 195.—*For Men and Women. On the second day of Show.* [38 entries.]

I. (**£4.**)—Mrs. L. R. Mildon.

II. (**£3.**)—Miss Smith.

III. (**£1 10s.**)—Miss B. Fletcher.

IV. (**£1.**)—Miss M. P. Baldwin.

R.—Miss R. James.

V.H.C.—Miss I. L. Bull.—Miss D. Smith.—Miss H. M. Trenchard.—Mrs. E. Watts.

H.C.—Miss B. Coles.—Miss J. Coles.—Mrs. N. Comer.—Miss M. Dalrymple.—Miss J. James.—Miss A. Jones.—Miss C. S. Nickels.—Mrs. W. Parris.—Miss M. Trickey.—Mrs. W. Watts.

C.—C. H. Beauchamp.—Miss M. C. Blamey.—F. Bunting.—Miss L. Cook.—Miss S. Harris.—Miss B. Letheron.—Mrs. B. Miles.—Miss E. M. Nicholas.—Miss M. Richards.—Miss M. D. Seager.—Miss F. M. Stephens.—Miss A. Yeates.

Class 196.—*For Men and Women. On the third day of Show.* [37 entries.]

I. (**£4.**)—Miss R. James.

II. (**£3.**)—Miss J. James.

III. (**£1 10s.**)—Mrs. B. Miles.

IV. (**£1.**)—Mrs. N. Comer.

R.—Miss M. Dalrymple.

V.H.C.—Miss M. P. Baldwin.—Miss A. Jones.—Miss H. M. Trenchard.

H.C.—Miss W. Dunn.—Miss E. Farrant.—Miss B. Fletcher.—Miss A. Furse.—Miss M. E. Guscott.—Miss B. Letheron.—Miss E. M. Nicholas.—Miss C. S. Nickels.—Miss M. Richards.—Miss Smith.—Miss D. Smith.——Miss M. L. Smith.—Miss M. Trickey.—Mrs. E. Watts.—Mrs. W. Watts.—Miss A. Yeates.

C.—C. H. Beauchamp.—Miss M. C. Blamey.—Miss N. Bowden.—Miss I. L. Bull.—Miss B. Coles.—Miss J. Coles.—Miss L. Cook.—Miss M. D. Seager.—Miss F. M. Stephens.—Miss M. Tucker.

Class 197.—*For Men and Women. On the fourth day of Show.* [24 entries.]

I. (**£4.**)—Miss M. P. Baldwin.

II. (**£3.**)—Miss H. M. Trenchard.

III. (**£1 10s.**)—Miss C. S. Nickels.

IV. (**£1.**)—Mrs. N. Comer.

R.—Miss W. Dunn.

V.H.C.—Miss B. Fletcher.—Mrs. B. Miles.—Miss M. Richards.

H.C.—Miss I. L. Bull.—Miss M. Dalrymple. Miss A. Furse.—Miss J. James.—Miss A. Jones.—Miss A. Newman.—Miss E. M. Nicholas.—Miss Smith.—Mrs. E. Watts.—Mrs. W. Watts.—Miss A. Yeates.

C.—Miss M. Cambray.

(The Prizes in Classes 198 to 201 were given by the Devon County Education Committee and were open only to Students who had obtained Certificates after having attended the course of instruction provided by the travelling Butter School in that County. A competitor could not take more than one prize in Classes 198 to 200.)

Class 198.—*For Students who had won a prize at a meeting of the Devon County Agricultural Association. On the second day of Show.* [15 entries.]

I. (£2.)—Miss W. Dunn.

II. (£1 10s.)—Miss M. Yeo.

III. (£1.)—Miss M. L. Smith.

IV. (10s.)—Miss M. Tucker.

R.—Miss C. S. Nickels.

V.H.C.—Miss E. M. Dunn.

H.C.—Mrs. E. A. Durman.—Miss M. E. Guscott.—Miss M. Trickey.

C.—Miss E. Elworthy.—Miss G. Joce.—Miss B. Letheren.—Mrs. W. Parris.—Miss L. Pearce.—Miss A. Pearce.

Class 199.—*For Students who had not won a prize at a meeting of the Devon County Agricultural Association. On the third day of Show.* [11 entries.]

I. (£2.)—Miss Smith.

II. (£1 10s.)—Miss F. B. Joce.

III. (£1.)—Miss G. Hellyar.

IV. (10s.)—Miss A. Cleverdon.

V.H.C.—Miss E. Walters.

H.C.—Miss I. Fewings.—Miss R. Letheren.

C.—Miss N. Bowden.—Miss M. Scanes.—Miss A. R. M. Wise.

Class 200.—*For Students not exceeding* 17 *years of age, who had not won a prize at a meeting of the Devon County Agricultural Association. On the fourth day of Show.* [2 entries.]

Equal I. (15s.) { Miss C. Allen
Miss M. M. Thomas.

CHAMPION CLASSES.

CLASS 201.—*For First and Second Prize Winners in Classes* 198, 199 *and* 200. *On the fifth day of Show.* [7 entries.]

I. (Gold Medal)—MISS ALLEN.

II. (Silver Medal)—MISS CLEVERDON.

III. (Bronze Medal)—MISS SMITH.

R.—MISS M. TUCKER.

V.H.C.—MISS THOMAS.

H.C.—MISS JOCE.

C.—MISS YEO.

CLASS 202.—*For Winners of First and Second Prizes in the Butter-making Classes* 194 *to* 200, *or at any previous meeting of the Society. On the fifth day of Show.* [17 entries.]

I. (Gold Medal)—MRS. N. COMER.

II. (Silver Medal)—MISS R. JAMES.

III. (Bronze Medal)—MISS W. DUNN.

R.—MISS BALDWIN.

V.H.C.—MISS M. CAMBRAY.—MISS M. DALRYMPLE.—MISS B. M. G. DARE.——MISS E. M. DUNN.—MISS J. JAMES.—MRS. E. WATTS.—MRS. W. WATTS.—MISS CLEVERDON.—MRS. MILDON.—MISS SEAGER.—MISS SMITH.—MISS TRENCHARD.—MISS YEO.

MILKING.

CLASS 203.—*For Men* 18 *years of age and over. On the third and fourth days of Show.* [12 entries.]

I. (£1 10s.)—W. HALLETT.

II. (£1.)—J. FRICKER, JUN.

III. (15s.)—G. ALLEN.

IV. (10s.)—J. H. ROWSE.

R.—E. SKINNER.

H.C.—W. R. BEER.—A. BOWDEN.—J. CODD.—S. MEAD.—H. W. PIDGEON.—W. H. STARK.

CLASS 204.—*For Women* 18 *years of age and over. On the first and second days of Show.* [12 entries.]

I. (£1 10s.)—MISS R. JAMES.

II. (£1.)—MRS. E. A. DURMAN.

III. (15s.)—MISS A. STACEY.

IV. (**10s.**)—Mrs. B. Miles.

R.—Miss A. Johns.

H.C.—Miss A. Cleverdon.—Miss E. L. Fishleigh.—Miss E. M. Nicholas.—Miss F. M. Stephens.

Class 205.—*For Boys and Girls under* 18 *years of age. On the fifth day of Show.* [6 entries.]

I. (**£1 10s.**)—Miss M. M. Arscott.

II. (**£1.**)—Miss M. Yeo.

III. (**15s.**)—Miss B. Letheren.

R.—Miss D. Johns.

H.C.—W. T. Gloyne.

SHOEING.

Class 206.—*For Nag Horse Shoeing, by Smiths* 25 *years of age and over on the day of the competition, who had not previously won the First Prize in a corresponding Class at one of the Society's meetings, or a Champion Prize at any other Society's Show. On the second day of Show.* [20 entries.]

I. (**£4.**)—T. Kerslake.

II. (**£3.**)—W. U. White, R.S.S.

III. (**£2.**)—H. J. Hole, R.S.S.

IV. (**£1.**)—D. Davies.

R. & V.H.C.—F. Young, R.S.S.

H.C.—E. Chilcott.—F. A. Taylor.

Class 207.—*For Cart Horse Shoeing, by Smiths* 25 *years of age and over on the day of the competition, who had not previously won the First Prize in a corresponding Class at one of the Society's meetings, or a Champion Prize at any other Society's Show. On the third day of Show.* [21 entries.]

I. (**£4.**)—J. C. Morris, A.S.C.

II. (**£3.**)—H. Jones, R.S.S.

III. (**£2.**)—T. Kerslake.

IV. (**£1.**)—F. Young, R.S.S.

R. & V.H.C.—H. J. Hole, R.S.S.

V.H.C.—Jas. Frayn.—G. J. Holloway.—H. Morgan, R.S.S.

H.C.—D. Davies.—J. S. Probert.

C.—J. Bradford.—E. Chilcott.—A. B. Childs.—H. Crook.—S. Heywood.—R. Jones, R.S.S.—C. F. Lowton.—C. F. Messenger.—D. Watkins.—H. B. Welland.—W. U. White, R.S.S.

CLASS 208.—*For Nag Horse Shoeing, by Smiths under 25 years of age on the day of the competition (Competitors in this Class were required to declare their age at the time of entry). On the fourth day of Show.* [16 entries.]

I. (**£4.**)—D. J. LEWIS.

II. (**£3.**)—J. H. BAKER.

III. (**£1.**)—E. CHILCOTT.

IV. (**10s.**)—W. F. SAUNDERS.

R. & V.H.C.—F. R. WHITEHORN.

V.H.C.—J. GARNISH.—J. VANSTONE, R.S.S.

H.C.—D. J. KERSLAKE, R.S.S.—U. WHITE.

CLASS 209.—*For Shoe Making or Turning, the patterns and descriptions of the Shoes being supplied by the Judge. On the fourth day of Show.* [16 entries.]

I. (**£4.**)—H. MORGAN, R.S.S.

II. (**£3.**)—H. JONES, R.S.S.

III. (**£2.**)—J. C. MORRIS, A.F.C.

IV. (**£1.**)—E. SAUNDERS.

R.—J. H. BAKER.

(The Prizes in Classes 210 to 212 were given by the Devon County Education Committee and competition was confined to Masters or Journeymen (not Apprentices) who had passed the examinations of the Devon County Farriery School previous to March 31, 1909).

CLASS 210.—*Hacks and Harness Horses. On the fifth day of Show.* [16 entries.]

I. (**£2 10s.**)—F. A. TAYLOR.

II. (**£1 10s.**)—J. H. BAKER.

III. (**£1.**)—D. J. KERSLAKE, R.S.S.

IV. (**10s.**)—W. H. STANBURY.

R.—W. EDWARDS.

CLASS 211.—*Hunters. On the fifth day of Show.* [6 entries.]

I. (**£2 10s.**)—P. PUDDICOMBE.

II. (**£1 10s.**)—W. H. STANBURY.

III. (**£1.**)—W. VOADEN, R.S.S.

IV. (**10s.**)—R. CLEMENTS.

CLASS 212.—*Agricultural Horses. On the fifth day of Show.* [11 entries.]

I. (**£2 10s.**)—H. T. HOLMAN, A.F.C.

II. (**£1 10s.**)—H. CROOK.

III. (**£1.**)—J. NORMAN, R.S.S.

IV. (**10s.**)—J. H. BAKER.

SHEARING.

(The Prizes in Classes 213 to 216 were given by the Devon County Education Committee and Competitors must have attended at least four Instruction Classes in their respective districts previous to May 26, 1909. The competitions took place on the 4th day of Show.)

CLASS 213.—*Best Shearing of two Sheep by Agricultural Labourers, exceeding* 19 *years of age.* [14 entries.]

I. (**£2.**)—C. FORD.

II. (**£1 10s.**)—G. HILL.

III. (**£1.**)—W. T. FORD.

IV. (**10s.**)—W. H. TRIGGER.

R.—B. CROOK.

CLASS 214.—*Best Shearing of two Sheep by Farmers or Farmers' Sons, exceeding* 19 *years of age.* [12 entries.]

I. (**£2.**)—J. CHUDLEY.

II. (**£1 10s.**)—E. FOLLAND.

III. (**£1.**)—C. SHAPLAND.

IV. (**10s**).—T. HAWKINS.

R.—W. SIMSCOTT.

CLASS 215.—*Best Shearing of two Sheep by Youths, exceeding* 16 *and and not exceeding* 19 *years of age.* [14 entries.]

I. (**£2.**)—J. C. THOMAS.

II. (**£1 10s.**)—F. YEALSLEY.

III. (**£1.**)—R. H. TRIGGER.

IV. (**10s.**)—A. HITT.

V. (**5s.**)—W. YEO.

R.—E. J. CHAPPLE.

CLASS 216.—*Best Shearing of two Sheep by Boys, not exceeding* 16 *years of age.* [4 entries.]

I. (**£1 10s.**)—W. J. THOMAS.

II. (**£1.**)—E. N. TRIGGER.

III. (**15s.**)—G. ALLIN.

(2s. 6d. was also given to each competitor in Classes 213 to 216 not being a prize-winner).

POULTRY.

The Birds in Classes 2 to 25 and 28 to 51 must have been hatched previous to January 1, 1909.

CLASS 1.—ANY DISTINCT BREED, COCK AND FOUR HENS, BRED IN 1907 OR 1908 (THE PROPERTY OF ONE EXHIBITOR, MATED FOR BREEDING). [21 entries.]

I. (**£5.**)—MISS J. FIELD, *White Pekin Bantams.*

II. (**£3.**)—H. REEVES, *Dorkings.*

III. (**£2.**)—W. BRENT, *Indian Game.*

R.—H. PORRITT, J.P.

V.H.C.—W. M. BELL, *Black Orpingtons.*—A. H. CORN, *Plymouth Rocks.*—MRS. L. C. PRIDEAUX, *Yokohamas.*—H. REEVES, *Dorkings.*—DITTO.—A. F. WOOTTEN, *Black Sumatra Game.*

H.C.—MISS S. S. BOUGHTON, *Black Orpingtons.*—W. P. HOLLIS, *White Wyandottes.*—M. LINDNER, *Orpingtons.*—H. Reeves, *Dorkings.*—E. H. TURRELL, *Yokohamas.*

C.—H. C. MARTIN, M.D., *Sussex.*

CLASS 2.—COCHIN, COCK. [6 entries.]

I. (**£1.**)—G. H. PROCTER.

II. (**15s.**)—R. A. FELTON.

III. (**10s.**)—W. AND H. WHITLEY.

R.—A. C. BUCKMASTER.

V.H.C.—ABBOT BROS.

H.C.—M. LINDNER.

CLASS 3.—COCHIN, HEN. [5 entries.]

I. (**£1.**)—R. A. FELTON.

II. (**15s.**)—G. H. PROCTER.

R.—W. AND H. WHITLEY.

V.H.C.—ABBOT BROS.—M. LINDNER.

CLASS 4.—BRAHMA, COCK. [7 entries.]

I. (**£1.**)—S. W. THOMAS.

II. (**15s.**)—J. C. TOZER.

III. (**10s.**)—S. J. SOUTHON.

R.—ABBOT BROS.

V.H.C.—MISS M. HOBLYN.

CLASS 5.—BRAHMA, HEN. [6 entries.]

I. (**£1.**)—J. F. HARRISON.

II. (**15s.**)—S. W. THOMAS.

III. (**10s.**)—H. SPENSLEY.

R.—J. C. TOZER.

H.C.—ABBOT BROS.

CLASS 6.—PLYMOUTH ROCK, COCK. [11 entries.]

I. (**£1.**)—A. H. CORN.

II (**15s.**)—DR. JACKSON.

III. (**10s.**)—H. PORRITT, J.P.

R.—W. E. DENNIS.

V.H.C.—T. J. ANDREW.

H.C.—ABBOT BROS.—T. ABBOT.

CLASS 7.—PLYMOUTH ROCK, HEN. [15 entries.]

I. (**£1**)—A. H. CORN.

II. (**15s.**)—A. H. CORN.

III. (**10s.**)—DR. JACKSON.

R.—P. B. GOVETT.

V.H.C.—T. J. ANDREW.—H. SPENSLEY.

H.C.—CAPT. C. H. MALLOCK.—T. S. MAY.—H. PORRITT, J.P.—J. D. TOOPE.

CLASS 8.—ORPINGTON (BUFF), COCK. [19 entries.]

I. (**£1.**)—R. ANTHONY.

II. (**15s.**)—A. C. GILBERT.

III. (**10s.**)—W. H. COOK.

R.—DR. JACKSON.

V.H.C.—J. H. BALKWILL.—MRS. L. CARNE & SONS.—H. PORRITT, J.P.—G. H. PROCTER.

H.C.—W. M. BELL.—G. KNAPMAN.—REV. E. C. NIGHTINGALE.—C. B. PAYNE.

CLASS 9.—ORPINGTON (BUFF), HEN. [8 entries.

I. (**£1.**)—R. ANTHONY.

II. (**15s.**)—SANDERSON BROS.

III. (**10s.**)—G. H. PROCTER.

R.—H. PORRITT, J.P.

V.H.C.—H. G. STOCKER.

H.C.—E. G. KNAPMAN

Class 10.—ORPINGTON (Any other Variety), COCK. [21 entries.]

I. (£1)—W. M. Bell.

II. (15s.)—W. H. Cornish.

III. (10s.)—A. C. Gilbert.

R.—W. O. Stanbury.

V.H.C.—T. C. Heath.—W. G. Kingwell.—H. Porritt, J.P.—G. W. Worrell.—J. H. Vaix.—H. Priest.

H.C.—W. Balment, Jun.—T. Fawkes.—H. Pyne.—T. E. Street.

Class 11.—ORPINGTON (Any other Variety), HEN. [17 entries.]

I. (£1.)—T. C. Heath.

II. (15s.)—W. H. Cornish,

III. (10s.)—H. Porritt, J.P.

R.—T. Hoyle.

V.H.C.—W. H. Cook.—A. C. Gilbert.

H.C.—W. M. Bell.—W. G. Kingwell.—M. Lindner.—Mrs. Bruce Ward.

Class 12.—MINORCA, COCK. [7 entries.]

I. (£1.)—Fursland Bros.

II. (15s.)—A. Tucker.

III. (10s.)—A. G. Pitts.

R.—A. G. Pitts.

H.C.—S. Diamond.—W. Snell.

Class 13.—MINORCA, HEN. [10 entries.]

I. (£1.)—A. G. Pitts.

II. (15s.)—Fursland Bros.

III. (10s.)—A. G. Pitts.

R.—Fursland Bros.

V.H.C.—R. Frayn.—F. C. Tozer.

H.C.—S. Diamond.—A. Tucker.

Class 14.—ANCONA, COCK. [2 entries.]

II. (15s.)—Rev. P. A. Butler.

Class 15.—ANCONA, HEN. [3 entries.]

II. (15s.)—W. Nelson.

III. (10s.)—C. A. Simmons.

R.—Rev. P. A. Butler.

Class 16.—SUSSEX, COCK. [16 entries.]

I. (£1.)—Abbot Bros.

II. (15s.)—W. Cubitt.

III. (10s.)—Sanderson Bros.

R.—Mrs. G. Trotter.

V.H.C.—J. Baily and Son.—S. G. Frost.—Sanderson Bros.—Col. E. Walker.—Ditto.

H.C.—Dr. F. Gravely.—H. C. Martin, M.D.

Class 17.—SUSSEX, HEN. [12 entries.]

I. (£1.)—W. H. Cook.

II. (15s.)—Abbot Bros.

III. (10s.)—Col. E. Walker.

R.—H. G. Stocker.

V.H.C.—J. Baily and Son.—Ditto.—H. C. Martin, M.D.—H. G. Stocker.

H.C.—H. G. Stocker.

Class 18.—DORKING (Coloured), COCK. [6 entries.]

I. (£1.)—J. Harris.

II. (15s.)—H. Reeves.

III. (10s.)—A. C. Major.

R.—Webber Bros.

H.C.—C. Ford.—W. and H. Whitley.

Class 19.—DORKING (Coloured), HEN. [7 entries.]

I. (£1.)—H. Reeves.

II. (15s.)—J. Harris.

III. (10s.)—A. C. Major.

R.—H. Reeves.

V.H.C.—J. Lloyd.—Ditto.

H.C.—Webber Bros.

Class 20.—DORKING (Silver Grey), COCK. [5 entries.]

I. (£1.)—H. Reeves.

II. (15s.)—H. Reeves.

R.—A. C. Major.

H.C.—C. G. Palmer.—Mrs. Sperling.

CLASS 21.—DORKING (SILVER GREY), HEN. [4 entries.]

I. (**£1.**)—A. C. MAJOR.

II. (**15s.**)—H. REEVES.

R.—H. REEVES.

H.C.—MRS. SPERLING.

CLASS 22.—DORKING (ANY OTHER VARIETY), COCK. [2 entries.]

II. (**15s.**)—A. C. MAJOR.

R.—A. C. MAJOR.

CLASS 23.—DORKING (ANY OTHER VARIETY), HEN. [6 entries.]

I. (**£1.**)—A. C. MAJOR.

II. (**15s.**)—A. C. MAJOR.

III. (**10s.**)—A. C. MAJOR.

R.—A. C. MAJOR.

H.C.—A. C. MAJOR.

CLASS 24.—FAVEROLLES, COCK. [8 entries.]

I. (**£1.**)—T. FAWKES.

II. (**15s.**)—C. H. BRADLEY.

III. (**10s.**)—T. H. JONES PARRY.

R.—C. H. BRADLEY.

V.H.C.—G. BETTS.—F. E. POPE.

CLASS 25.—FAVEROLLES, HEN. [9 entries.]

I. (**£1.**)—W. G. KINGWELL.

II. (**15s.**)—C. H. BRADLEY.

III. (**10s.**)—F. E. POPE.

R.—T. H. JONES PARRY.

V.H.C.—C. H. BRADLEY.

H.C.—G. BETTS.

(In Classes 26 and 27 the birds must have been hatched after December 31st, 1908, and must not have moulted all the chicken flight feathers of the wing).

CLASS 26.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX OR DORKING, COCKEREL. [18 entries.]

I. (**£1.**)—H. REEVES, *Dorking*, January.

II. (**15s.**)—G. J. CLOW, R.N., *Orpington*, January 11.

III. (**10s.**)—W. H. COOK, *Orpington*, January 3.

R.—H. Porritt, J.P.

V.H.C.—G. J. Clow, R.N., *Orpington*, January 1.—Greatorex and Chowner, *Orpington*, January 3.—H. Porritt, J.P.

H.C.—Mrs. L. Carne and Sons, *White Rock*, January 3.—G. J. Clow, R.N., *Orpington*, January 11.—M. Lindner, *Orpington*, January 12.—W. and H. Whitley, *Dorking*, January.

Class 27.—COCHIN, BRAHMA, PLYMOUTH ROCK, ORPINGTON, LANGSHAN, SUSSEX, or DORKING, PULLET. [19 entries.]

I. (£1)—H. Porritt, J.P.

II. (15s.)—T. C. Heath, *Orpington*, January 20.

III. (10s.)—T. Abbot, *Orpington*, February 1.

R.—Mrs. L. Carne and Sons, White Rock, January 3.

V.H.C.—W. H. Cook, *Orpington*, January 3.—Greatorex and Chowner *Orpington*, January 3.

H.C.—T. Abbot, *Orpington*, February 1.—G. J. Clow, R.N., *Orpington*, January 11.—Dr. Jackson, January.—H. C. Lacy, *Buff Orpington*, January 16.

Class 28.—LANGSHAN, COCK. [4 entries.]

I. (£1.)—R. Anthony.

II. (15s.)—R. Butland.

R.—H. Wallis.

H.C.—G. F. C. Pyper.

Class 29.—LANGSHAN, HEN. [3 entries.]

I. (£1.)—R. Anthony.

II. (15s.)—G. Fielder.

R.—H. Wallis.

Class 30.—WYANDOTTE (Silver or Gold Laced), COCK. [8 entries.]

I. (£1.)—S. Climas.

II. (15s.)—R. Anthony.

III. (10s.)—N. H. Reed.

R.—N. H. Reed.

H.C.—Miss L. A. Martin.—Ditto.

Class 31.—WYANDOTTE (Silver or Gold Laced), HEN. [12 entries.]

I. (£1)—R. Anthony.

II. (15s.)—T. C. Heath.

III. (10s.)—W. Yoxall.

R.—N. H. Reed.

V.H.C.—S. Climas.—H. Spensley.

H.C.—G. H. Dalrymple.—N. H. Reed.—W. and H. Whitley.—A. Winfield.—H. Priest.

Class 32.—WYANDOTTE (White), COCK. [22 entries.]

I. (£1.)—R. Anthony.

II. (15s.)—W. and H. Whitley.

III. (10s.)—T. Fawkes.

R.—A. C. Roberts.

V.H.C.—M. Lindner.—N. H. Reed.—W. and H. Whitley.

H.C.—Miss Gidley.—F. Gilling.—W. Holman.—Capt. C. G. Manners-Sutton.—W. J. Snow.—Mrs. S. B. Whitley.

Class 33.—WYANDOTTE (White), HEN. [19 entries.]

I. (£1.)—Abbot Bros.

II. (15s.)—R. Anthony.

III. (10s.)—H. Spensley.

R.—Miss Edwards.

V.H.C.—N. H. Reed.—W. and H. Whitley.

H.C.—W. H. Cook.—F. Gilling.—Capt. C. G. Manners-Sutton.—T. W. Newton.—Rev. E. C. Nightingale.—A. C. Roberts.—F. J. Shapley.—S. B. Sparkes.—Teign Poultry Farm.—W. and H. Whitley.

Class 34.—WYANDOTTE (Any other Variety), COCK. [12 entries.]

I. (£1.)—T. C. Heath.

II. (15s.)—A. H. Corn.

III. (10s.)—R. Anthony.

R.—S. Tippett.

V.H.C.—C. P. Telling.

H.C.—F. C. Constable.—Col. C. M. Edwards.—J. Hearn.—S. C. King.—H. Porritt, J.P.—F. Roberts.—C. A. Simmons.

Class 35.—WYANDOTTE (Any other Variety), HEN. [7 entries.]

I. (£1.)—J. Hearn.

II. (15s.)—A. H. Corn.

II. (10s.)—T. C. Heath.

H.C.—R. Anthony.—Col. C. M. Edwards.—H. Porritt, J.P.

Class 36.—LEGHORN (White), COCK. [7 entries.]

I. (£1.)—R. Anthony.

II. (15.)—C. W. Kellock.

III. (10s.)—Rev. R. Chichester.

V.H.C.—Capt. C. G. Manners-Sutton.

H.C.—R. Dockett.—W. Pickard.

CLASS 37.—LEGHORN (WHITE), HEN. [10 entries.]

I. (**£1.**)—R. ANTHONY.

II. (**15s.**)—J. H. PRIDE.

III. (**10s.**)—REV. R. CHICHESTER.

R.—F. S. TAYLOR.

V.H.C.—R. DOCKETT.

H.C.—CAPT. C. G. MANNERS-SUTTON.—DITTO.—A. H. STANBURY.—W. AND H. WHITLEY.

CLASS 38.—LEGHORN (ANY OTHER VARIETY). COCK. [2 entries.]

I. (**£1**)—W. O. STANBURY.

R.—R. ANTHONY.

CLASS 39.—LEGHORN (ANY OTHER VARIETY), HEN. [3 entries.]

I. (**£1.**)—R. ANTHONY.

II. (**15s.**)—F. G. EDWARDS.

R.—W. AND H. WHITLEY.

CLASS 40.—HAMBURG, COCK. [9 entries.]

I. (**£1.**)—T. HOYLE.

II. (**15s.**)—R. ANTHONY.

III. (**10s.**)—W. SNELL.

R.—H. FORTUNE.

H.C.—F. CLARK.—PERKIN AND SONS.—F. E. THOMAS.—W. AND H. WHITLEY.

CLASS 41.—HAMBURG, HEN. [14 entries.]

I. (**£1.**)—J. R. R. MITCHELL.

II. (**15s.**)—R. ANTHONY.

III. (**10s.**)—T. FAWKES.

R.—F. E. THOMAS.

V.H.C.—W. H. AVERY.—H. FORTUNE.—T. HOYLE.—W. SNELL.—F. E. THOMAS.

H.C.—J. AUCKLAND.—J. BARROW.—W. SNELL.—DITTO.—W. AND H. WHITLEY.

CLASS 42.—OLD ENGLISH GAME, COCK. [16 entries.]

I. (**£1.**)—T. C. HEATH.

II. (**15s.**)—A. H. CORN.

III. (**10s.**)—F. G. STEVENSON.

R.—W. and H. Whitley.

V.H.C.—J. C. Huxtable.—M. Lindner.—W. and H. Whitley.—Ditto.

H.C.—Capt. C. H. Chichester.—Q. Le Pelley.—Ditto.—Capt. C. G Manners-Sutton.—H. C. Martin, M.D.—C. Wilson.

Class 43.—OLD ENGLISH GAME, HEN. [12 entries.]

I. (£1.)—F. G. Stevenson.

II. (15s.)—T. C. Heath.

III. (10s.)—J. C. Huxtable.

R.—W. G. Kingwell.

V.H.C.—J. H. Bant.—W. and H. Whitley.—Ditto.

H.C.—Q. Le Pelley.—Capt. C. G. Manners-Sutton.

Class 44.—INDIAN GAME, COCK. [11 entries.]

I. (£1.)—J. Taylor.

II. (15s.)—W. J. Camp.

III. (10s.)—W. Brent.

R.—R. Dockett.

V.H.C.—Chelfham Poultry Co.

H.C.—J. C. Huxtable.—A. Stone.—W. and H. Whitley.

Class 45.—INDIAN GAME, HEN. [10 entries.]

I. (£1.)—W. Brent.

II. (15s.)—T. Abbot.

III. (10s.)—W. A. Martin.

R.—Chelfham Poultry Co.

H.C.—T. Abbot.—W. and H. Whitley.—Ditto.

Class 46.—MALAY, COCK. [9 entries.]

I. (£1.)—T. Hammett.

II. (15s.)—J. Hosken.

III. (10s.)—J. C. Huxtable.

R.—W. Baskerville, Jun.

V.H.C.—S. J. Talbot.

H.C.—Cooke and Curvis.—J. Dullam.—J. C. Huxtable.

Class 47.—MALAY, HEN. [7 entries.]

I. (£1.)—S. J. Talbot.

II. (15s.)—G. C. Dennis.

III. (**10s.**)—J. C. Huxtable.

R.—G. C. Dennis.

V.H.C.—Rev. P. A. Butler. —J. C. Huxtable.

H.C.—Cooke and Curvis.

Class 48.—FRENCH (Excluding Faverolles), COCK. [10 entries.]

I. (**£1.**)—S. W. Thomas.

II. (**15s.**)—G. H. Dalrymple, *Houdan.*

III. (**10s.**)—A. Mogford, *Houdan.*

R.—H. Edye, *Houdan.*

V.H.C.—P. Hanson, *Houdan.*—S. W. Thomas.—Ditto.

H.C.—Miss M. Dolben, *Houdan.*—H. Edye, *Houdan.*—G. Henwood.

Class 49.—FRENCH (Excluding Faverolles), HEN. [7 entries.]

I. (**£1.**)—S. W. Thomas.

II. (**15s.**)—H. Edye, *Houdan.*

III. (**10s.**)—S. W. Thomas.

V.H.C.—P. Hanson, *Houdan.*

H.C.—H. Edye, *Houdan.*—W. and H. Whitley, *Houdan.*—Ditto.

Class 50.—ANY OTHER DISTINCT BREED (not previousty mentioned), COCK. [9 entries.]

I. (**£1.**)—T. C. Heath.

II. (**15s.**)—Hoskins Bros.

III. (**10s.**)—H. Hoblyn.

R.—F. R. Stephens, *Black Sumatra Game.*

V.H.C.—J. R. R. Mitchell, *Aseel.*—Miss G. S. F. Wilson, *Yokohama.*—Ditto.—Ditto.

H.C.—W. Snell, *Brown Red Game.*

Class 51.—ANY OTHER DISTINCT BREED (not previously mentioned), HEN. [8 entries.]

I. (**£1.**)—J. C. Huxtable.

II. (**15s.**)—T. C. Heath.

III. (**10s.**)—T. Abbot, *Andalusian.*

R.—J. Auckland, *Spanish.*

H.C.—H. Priest.—Miss G. S. F. Wilson, *Yokohama.*—Ditto.

f

(In Classes 52 to 59 the birds must have been hatched after December 31st, 1908, and must not have moulted all the chicken flight feathers of the wing.

CLASS 52.—MINORCA, ANCONA, WYANDOTTE, LEGHORN, HAMBURG, FAVEROLLES OR FRENCH, COCKEREL. [26 entries.]

I. (£1.)—W. E. H. HANCOCK, *Wyandotte*, January 5.

II. (15s.)—T. C. HEATH, *Wyandotte*, January 20.

III. (10s.)—MRS. A. SKINNER, *Wyandotte*, January 10.

R.—J. HEARN, January.

V.H.C.—MISS GIDLEY, *Wyandotte*, January 1.—F. GILLING, *Wyandotte*, January 4.—H. A. SANDERS.—W. AND H. WHITLEY, *Minorca*, January.—DITTO, *Wyandotte.*

H.C.—T. ABBOT, *Wyandotte*, January 20.—T. FAWKES, *Minorca*, January 2.—W. A. GODFREE, *Minorca*, January 16.—S. C. KING, *Black Wyandotte*, January 6.—G. PAYNE, *Wyandotte*, January 1.—H. PORRITT, J.P.—C. A. SIMMONS, *Ancona*, February 11.—REV. O. R. VASSALL-PHILLIPS, *Leghorn*, January 2.—W. AND H. WHITLEY, *Leghorn.*—DITTO, *Hamburg.*—A. WINFIELD, *Wyandotte*, January 5.

CLASS 53.—MINORCA, ANCONA, WYANDOTTE, LEGHORN, HAMBURG FAVEROLLES OR FRENCH, PULLET. [24 entries.]

I. (£1.)—MRS. A. SKINNER, *Wyandotte*, January 10.

II. (15s.)—W. E. H. HANCOCK, *Wyandotte*, January 11.

III. (10s.)—T. FAWKES, *Minorca*, January 2.

V.H.C.—S. DIAMOND, *Minorca*, January 7.—N. H. REED, *Wyandotte.*—W. AND H. WHITLEY, *Wyandotte.*—DITTO, *Hamburg.*

H.C.—T. ABBOT, *Wyandotte*, January 7.—DITTO.—C. DAVIS, *Wyandotte*, February 12.—T. FAWKES, *Minorca*, January 2.—F. GILLING, *Wyandotte*, January 4.—W. HURST, *Black Wyandotte*, January 6.—S. C. KING, *Black Wyandotte*, January 2.—G. PAYNE, *Wyandotte*, January 1.—C. A. SIMMONS, *Wyandotte*, February 7.—REV. O. R. VASSALL-PHILLIPS, *Leghorn*, January 2.—W. AND H. WHITLEY, *Minorca.*—A. WINFIELD, *Wyandotte*, January 5.

CLASS 54.—GAME, MALAY, OR ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), COCKEREL. [15 entries.]

I. (£1.)—W. A. MARTIN, *Indian Game*, January 3.

II. (15s.)—J. HOSKEN, January 16.

III. (10s.)—W. BASKERVILLE, JUN., *Malay*, 4½ m.

R.—W. BRENT, *Indian Game.*

V.H.C.—T. BENNETTS, *Malay*, January 2.—W. J. CAMP, *Indian Game*, January 14.—W. H. CORNISH, *Orpington*, January 9.—J. REED, *Malay*, January 6.—J. RIDGE, *Malay*, January 15.—W. AND H. WHITLEY, *Old English Game*, January.

H.C.—J. N. JACKMAN, *Indian Game*, January 5.—W. AND H. WHITLEY, *Old English Game*, January.

CLASS 55.—GAME, MALAY, OR ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), PULLET. [10 entries.]

I. (**£1.**)—W. J. CAMP, *Indian Game*, January 14.

II. (**15s.**)—W. BASKERVILLE, jun., *Malay*, 4½m.

III. (**10s.**)—J. HOSKEN, January 16.

V.H.C.—W. BRENT, *Indian Game*.—T. C. HEATH, *Game*, January 20.—J. REED, *Malay*, January 6.—J. RIDGE, *Malay*, January 15.—W. AND H. WHITLEY, *Old English Game*, January.—DITTO.

LIVE TABLE POULTRY.

CLASS 56.—PAIR OF COCKERELS OF ANY PURE BREED. [8 entries.]

I. (**£1.**)—W. A. MARTIN, *Indian Game*, January 3.

II. (**15s.**)—J. BAILY AND SON, January.

III. (**10s.**)—H. REEVES, *Dorkings*, January 2.

V.H.C.—R. W. CARPENTER, *Indian Game*, January 30.—A. DAVEY AND SONS, *White Wyandottes*, January 26.—MISS GIDLEY, *Plymouth Rocks*, January 1.—WEBBER BROS., *Dorkings*, January 16.

H.C.—MRS. BRUCE WARD, *Sussex*, January 10.

CLASS 57.—PAIR OF PULLETS OF ANY PURE BREED. [8 entries.]

I. (**£1.**)—J. BAILY AND SONS, January.

II. (**15s.**)—W. G. HICKS, *Indian Game*, January 9.

III. (**10s.**)—MRS. BRUCE WARD, *Orpingtons*, January 10.

R.—H. REEVES, *Dorkings*, January 2.

V.H.C.—W. G. HICKS, *Indian Game*, January 3.—H. REEVES, *Dorkings*, January 2.

H.C—A. DAVEY AND SONS, *Wyandottes*, January 26.

CLASS 58.—PAIR OF CROSS-BRED COCKERELS. [3 entries.]

I. (**£1.**)—MRS. E. MAYNARD, January 12.

III. (**10s.**)—MRS. BRUCE WARD, *Dorking-Orpington*, January 14.

H.C.—W. G. HICKS, *Malay-Indian Game*, January 3.

CLASS 59.—PAIR OF CROSS-BRED PULLETS. [4 entries.]

I. (**£1.**)—MRS. BRUCE WARD, *Dorking-Orpington*, January 14.

III. (**10s.**)—W. G. HICKS, *Malay-Indian Game*, January 3.

R.—MISS E. MAYNARD, January 12.

SELLING CLASSES.

CLASS 60.—ANY DISTINCT BREED, COCK OR COCKEREL (PRICE NOT TO EXCEED £1 1s.). [27 entries.]

I. (£1.)—H. REEVES, *Dorking.*

II. (15s.)—A. TRUSCOTT, *Indian Game.*

III. (10s.)—S. CLIMAS, *Wyandotte.*

R.—W. G. KINGWELL.

V.H.C.—R. ANTHONY.—J. H. BALKWILL, *Buff Orpington.*—L. H. AND J. NUTTER, *Orpington.*—F. J. SHAPLEY, *Wyandotte.*—F. C. THOMAS, *Hamburg.*

H.C.—W. J. CAMP, *Indian Game.*—A. H. CORN.—H. EDYE.—J. R. R. MITCHELL, *Orpington.*—W. AND H. WHITLEY.

CLASS 61.—ANY DISTINCT BREED, HEN OR PULLET (PRICE NOT TO EXCEED £1 1s.). [15 entries.]

I. (£1.)—J. R. R. MITCHELL, *Hamburg.*

II. (15s.)—J. AUCKLAND, *Spanish.*

III. (10s.)—A. H. CORN.

R.—W. BRENT, *Indian Game.*

V.H.C.—R. ANTHONY.—T. C. HEATH.—W. G. KINGWELL.—H. REEVES, *Dorking.*—F. E. THOMAS, *Hamburg.*

SPECIAL PRIZES.

Given by the Poultry Club, under conditions stated on Entry Form. Challenge Cups, value £10 10s. each :—

(*a*) For the best Cock or Cockerel in the Poultry Classes, the property of a member of the Poultry Club. 1.—W. M. BELL.
(*b*) For the best Hen or Pullet in the Poultry Classes, ditto, ditto. 1.—T. C. HEATH.

Challenge Cups, value £5 5s. each :—

(*c*) For the best Orpington, the property of a Member of the Poultry Club. 1.—W. M. BELL.
(*d*) For the best Wyandotte, ditto, ditto. 1.—R. ANTHONY.
(*e*) For the best Leghorn, ditto, ditto. 1.—W. O. STANBURY.
(*f*) For the best Plymouth Rock, ditto, ditto. 1.—A. H. CORN.

A Silver Medal for the best Cock in the Poultry Classes, the property of a Member of the Poultry Club. 1.—W. M. BELL.

A Silver Medal for the best Hen, ditto, ditto. 1.—T. C. HEATH.

A Silver Medal for the best Cockerel, ditto, ditto. 1.—H. REEVES.

A Silver Medal for the best Pullet, ditto, ditto. 1.—H. PORRITT, J.P.

DUCKS, GEESE AND TURKEYS.

CLASS 62.—DRAKE OR DUCK (AYLESBURY). [7 entries.]

I. (£1.)—H. G. WESTON.

II. (15s.)—R. ANTHONY.

III. (10s.)—R. SHIPLEY.

R.—LOCK BROS.

V.H.C.—MRS. F. READ.

CLASS 63.—DRAKE OR DUCK (ROUEN). [5 entries.]

I. (**£1.**)—A. H. CORN.
III. (**10s.**)—HAYNES BROS.
R.—R. ANTHONY.
H.C.—HAYNES BROS.

CLASS 64.—DRAKE OR DUCK (PEKIN). [5 entries.]

I. (**£1.**)—MRS. B. BAILEY.
III. (**10s.**)—W. F. SNELL.
R.—R. SHIPLEY.
V.H.C.—MRS. B. BAILEY.—W. F. SNELL.

CLASS 65.—GANDER OR GOOSE. [5 entries.]

I. (**£1.**)—ABBOT BROS.
II. (**15s.**)—W. F. SNELL.
R.—W. F. SNELL.
V.H.C.—MRS. M. LOCK.

CLASS 66.—TURKEY, COCK OR HEN. [6 entries].

I. (**£1.**)—W. SAUL.
II. (**15s.**)—ABBOT BROS.
III. (**10s.**)—T. ABBOT.
R.—T. ABBOT.
V.H.C.—W. F. SNELL.

DEAD TABLE POULTRY.

(*Forwarded alive and killed and plucked by a Poulterer acting for the Society*).

(In Classes 67 to 71 the birds must have been hatched after December 31st, 1908, and must not have moulted all the chicken flight feathers of the wing).

CLASS 67.—PAIR OF COCKERELS OF ANY PURE BREED. [7 entries.]

I. (**£1.**)—F. H. WHEELER, *Orpingtons*, January 14.
II. (**15s.**)—MRS. BRUCE WARD, *Sussex*, January 10.
III. (**10s.**)—F. H. WHEELER, *Orpingtons*, January 14.
R.—COL. C. M. EDWARDS, *Orpingtons*, February 2.

Class 68.—PAIR OF PULLETS OF ANY PURE BREED. [7 entries.]

I. (**£1.**)—F. H. Wheeler, *Orpingtons.*

II. (**15s.**)—W. G. Hicks, *Indian Game.*

III. (**10s.**)—F. H. Wheeler, *Orpingtons.*

R.—H. Reeves, *Dorkings*, January 2.

H.C.—Col. C. M. Edwards, *Orpingtons*, February 2.—G. H. Stanbury, *Indian Game*, February 14.

Class 69.—PAIR OF CROSS-BRED COCKERELS. [6 entries.]

I. (**£1.**)—Mrs. Bruce Ward, *Indian Game-Orpington*, January 10.

II. (**15s.**)—F. H. Wheeler, *Sussex-Orpington*, January 14.

III. (**10s.**)—Mrs. G. Nelson, *Indian Game-Dorking*, January 12.

R.—T. P. Axford, *Game-Buff Orpington*, January 10.

Class 70.—PAIR OF CROSS-BRED PULLETS. [4 entries]

II. (**15s.**)—Mrs. Bruce Ward, *Dorking-Orpington*, January 14.

III. (**10s.**)—F. A. Wheeler, *Sussex-Orpington*, January 14.

Class 71.—PAIR OF DUCKLINGS. [3 entries.]

II. (**15s.**)—H. G. Weston.

III. (**10s.**)—Mrs. F. Read, March 25.

R.—C. F. B. Eddowes, February 20.

LACE.

(Open only to Pupils in the Devon County Council Classes.)

Class 1.—LENGTHS OF LACE. [6 entries.]

I. (£1 10s.)—E. Carter, S. Pile, E. Pile, M. Mayne, Bicton.

II. (£1.)—Mrs. Durrant, Mrs. Newton, Mrs. Westlake and D. Rogers, Beer.

III. (10s.)—Miss E. Carter, Bicton.

Class 2.—HANDKERCHIEFS OR CHALICE VEILS. [10 entries.]

I. (£1 10s.)—Ethel Kemp, Awliscombe (Pillow-point).

II. (£1.)—Mabel Mayne, Bicton (Pillow-point).

III. (10s.)—Mrs. Pease, Belstone (Pillow-point Guipure).

Class 3.—D'OYLEYS. [6 entries.]

I. (15s.)—Eda Russell, Awliscombe.

II. (10s.)—Beatrice Knight, Sampford Courtenay.

III. (5s.)—L. Gush, L. Perry, G. Newton, Branscombe.

Class 4.—FANS. [4 entries.]

I. (£1 10s.)—Six Members of Children's Class, Woodbury (Applique).

II. (£1.)—Mrs. May, Sampford Courtenay (Honiton Pillow-point ground).

III. (10s.)—Mrs. Godfrey, Mr. Havel, A. Marks, and A. Hitchcock, Woodbury (Honiton Pillow-point ground).

Class 5.—SPRAYS. [6 entries.]

I. (10s.)—Ethel Kemp, Awliscombe.

II. (7s. 6d.)—Mrs. Haval, Woodbury.

III. (5s.)—Eda Russell, Awliscombe.

FORESTRY.

Class 1.—FOR A GENERAL COLLECTION OF EXHIBITS ILLUSTRATIVE OF FORESTRY. [6 entries.]

I. (Gold Medal).—Duke of Wellington, K.G., Stratfieldsaye House, Mortimer, R.S.O., Berks.

II. (Silver Medal).—Miss E. C. Talbot, Margam Park, South Wales.

III. (Bronze Medal).—Rev. W. P. Bastard, Kitley and Buckland Court, Devon.

Class 2.—FOR BOARDS OF SCOTS PINE (*Pinus sylvestris*). [7 entries.]

I. (Silver Medal).—Sir C. T. Dyke Acland, Bart., Killerton, Exeter.

II. (Bronze Medal).—Earl Beauchamp, K.C.M.G., Madresfield Court, Malvern.

H.C.—Duke of Wellington, K.C., Startfieldsaye House, Mortimer, R.S.O., Berks.

C.—Rev. W. P. Bastard, Kitley and Buckland Court, Devon.

Class 3.—FOR BOARDS OF LARCH (*Larix europen*). [6 entries.]

I. (Silver Medal).—Sir C. T. Dyke Acland, Bart., Killerton, Exeter.

II. (Bronze Medal).—Earl of Carnarvon, Highclere Castle, Newbury.

C.—Rev. W. P. Bastard, Kitley and Buckland Court, Devon.

Class 4.—FOR BOARDS OF NORWAY SPRUCE (*Picea excelsa*). [5 entries.]

I. (Silver Medal).—Rev. W. P. Bastard, Kitley and Buckland Court, Devon.

II. (Bronze Medal).—Earl of Carnarvon, Highclere Castle, Newbury.

H.C.—Sir C. T. Dyke Acland, Bart., Killerton, Exeter.

C.—Duke of Wellington, K.G., Stratfieldsaye House, Mortimer, R.S.O., Berks.

Class 5.—FOR BOARDS OF ASH (*Fraxinus Excelsior*), OAK (*Quercus robur*), AND ELM (*Ulmus Campestris*). [4 entries.]

I. (Silver Medal).—Sir C. T. Dyke Acland, Bart., Killerton, Exeter.

II. (Bronze Medal).—Earl of Carnarvon, Highclere Castle, Newbury.

H.C.—Duke of Wellington, K.G., Stratfieldsaye House, Mortimer, R.S.O., Berks.

C.—Earl Beauchamp, K.C.M.G., Madresfield Court, Malvern.

Class 6.—FOR BOARDS OF ANY THREE NON-CONIFEROUS TIMBERS OTHER THAN THE ABOVE. [3 entries.]

I. (Silver Medal).—Sir C. T. Dyke Acland, Bart., Killerton, Exeter.

II. (Bronze Medal).—Duke of Wellington, K.G., Stratfieldsaye House, Mortimer, R.S.O., Berks.

H.C.—Earl Beauchamp, K.C.M.G., Madresfield Court, Malvern.

Class 7.—FOR A 9-Ft. FIELD GATE, MANUFACTURED UPON AN ESTATE FROM HOME GROWN TIMBER, SHOWN IN WORKING ORDER. THE WOOD MUST NOT BE DRESSED, CREOSOTED, OR PAINTED. [4 entries.]

I. (Silver Medal).—Earl Fortescue, Castle Hill Estate, Filleigh, South Molton, North Devon.

II. (Bronze Medal).—Earl Beauchamp, K.C.M.G., Madresfield Court, Malvern.

CLASS 8.—FOR EXHIBITS ILLUSTRATIVE OF FORESTRY CONTRIBUTED BY INSTITUTIONS OR BY ESTATES NOT DESIROUS OF ENTERING IN COMPETITIVE CLASSES.

CLASS 9.—FOR A PURE LARCH OR MIXED PLANTATION, NOT LESS THAN FIVE ACRES AND OF NOT LESS THAN FIVE OR MORE THAN TEN YEARS GROWTH; IN THE COUNTY OF DEVON.

1st Prize, a Silver Medal; 2nd Prize, 2 Bronze Medal.

[NO ENTRY.]

CLASS 10.—FOR FORESTRY TOOLS AND APPLIANCES EXHIBITED BY TRADING FIRMS.

[NO ENTRY.]

NATURE STUDY.

Certificates of Merit were awarded to:—

BARNSTAPLE EDUCATION COMMITTEE.
BATH, BATHFORD NATIONAL SCHOOL.
BATH, OLDFIELD BOYS' COUNCIL SCHOOL.
BLANDFORD, DORSET, ALMER COUNCIL SCHOOL.
EXETER, ST. THOMAS'S GIRLS' SCHOOL.
EXETER, EXWICK COUNCIL SCHOOL.
EXETER, MINT BOYS' SCHOOL.
EXETER, NEWTOWN BOYS' COUNTY SCHOOL.
TAUNTON, BISHOP FOX'S GIRLS' SCHOOL.
WESTON-SUPER-MARE, ST. JOHN'S BOYS' (PRIMARY DAY) SCHOOL.
WESTON-SUPER-MARE, ST. JOHN'S GIRLS' (PRIMARY DAY) SCHOOL.

Bath and West and Southern Counties Society.

OBJECTS OF THE SOCIETY AND PRIVILEGES OF MEMBERSHIP.

ANNUAL EXHIBITIONS.

The Society annually holds an Exhibition in some city or town in England or Wales. Each section of the Society's district is visited at intervals, so that most Members have an opportunity of seeing the Show in their own neighbourhood every few years. Prizes to a large amount are given for Horses, Cattle, Sheep, Pigs, Farm Produce, &c. Provision is also made for the exhibition of Agricultural Implements and Machinery, Seeds, Cattle Foods, Artificial Manures, and articles of general utility. A substantially built and completely equipped Working-Dairy on a large scale is a special feature of these Exhibitions. Here explanatory demonstrations, and comparative tests of implements and processes are carried on with the assistance of well-known practical and scientific experts, and Butter-making Competitions are held. Among the features of the Annual Meeting are Shoeing, Milking and other Competitions, Poultry and Horticultural Shows, and Exhibitions illustrative of Bee-keeping, Home Industries, Art-Manufactures, Nature Study and Forestry.

Membership entitles to free admission to the Annual Exhibition, and also to the Grand Stand overlooking the Horse and Cattle Ring, to the Reserved Seats in the Working Dairy, and to the use of the Members' Special Pavilion for Reading, Writing, &c.

Entries can be made by Members (elected on or before the last Tuesday in January preceding the Show) at half the Fees payable by Non-Members.

THE JOURNAL.

All Members receive free of charge the Society's Journal, which is published annually bound in cloth. It has for its aim the dissemination of agricultural knowledge in a popular form, and in addition to original articles by well-known agricultural authorities, it contains particulars of the Society's general operations, full reports of its experimental and research work, prize awards, financial statements, lists of Members, reviews of new books on agriculture, &c. (The price of the *Journal* to non-Members is 6s. 4d. post free.)

CHEMICAL, BOTANICAL AND OTHER FACILITIES.

The Society has a Consulting Chemist (Dr. J. A. Voelcker, M.A., F.I.C., &c.), and a Consulting Botanist (Mr. J. H. Priestley, B.Sc., F.L.S., University College, Bristol) *from whom Members can obtain analyses and reports at reduced rates of charge.* An arrangement has also been made under which Members of the Society can obtain, free of charge, from the National Fruit and Cider Institute at Long Ashton, analyses of cider-apples and perry-pears.

EXPERIMENTS.

Experiments on crops are conducted at experimental stations in various parts of the Kingdom, and *Members are enabled to take part in these and to receive reports thereon.*

ART-MANUFACTURES, NATURE STUDY, FORESTRY, &c.

One of the objects for which the Society was founded was the encouragement of Arts as well as Agriculture, and, to this end, exhibitions are held of Art-Manufactures and of work representative of Arts and Handicrafts. Exhibitions are also held illustrating Nature Study, as a branch of Education; the Science of Forestry, &c.

TERMS OF MEMBERSHIP.

ANNUAL SUBSCRIPTIONS.

Ordinary Members, not less than £1

Tenant Farmers, the rateable value of whose holdings does not exceed £200 a-year, not less than .. .. 10s.

Governors who are eligible for election as President, or Vice-President, and who subscribe not less than £2, are entitled, in addition to the privileges already mentioned, to an extra Season Ticket for the Annual Exhibition and to the Grand Stand, &c. Governors subscribing more than £2 are entitled to a further Ticket for every additional £1 subscribed.

Members subscribing less than £1 are entitled to all the privileges of Membership except that of entering Stock at reduced fees, and their admission Ticket for the Annual Show is available for *one day only* instead of for the whole time of the Exhibition.

LIFE COMPOSITIONS.

Governors may compound for their Subscription for future years by payment, in advance, of £20; and Members by payment, in advance, of £10. Governors and Members who have subscribed for twenty years may become Life Members on payment of half these amounts.

Any person desirous of joining the Society can be proposed by a Member, or by

THOS. F. PLOWMAN,

Secretary and Editor,

3, Pierrepont Street, Bath.

Telegraphic Address—" PLOWMAN, BATH."

Telephone—No. **610.**

Bath and West and Southern Counties Society.

GENERAL LAWS.

As revised in accordance with the Report of a Special Committee; which Report was received and adopted by the Annual General Meeting of Members, held on May 30, 1895.

COMPOSITION OF THE SOCIETY.

I. The Society shall consist of a President, Vice-Presidents, Trustees, Council. Treasurer, Secretary, and Members.

OBJECTS.

II. The Society shall have the following objects :—

a. To hold Exhibitions of breeding stock, agricultural implements, and such other articles connected with agriculture, arts, manufactures or commerce, as may be determined upon by the Council.

b. To conduct practical and scientific investigations in agriculture.

c. To promote technical education in agriculture by providing means of systematic instruction.

d. To publish a Journal for circulation.

SUBSCRIPTIONS.

III. The Annual Subscription for Members shall be as follows :—

Governors (who are eligible for election as President or Vice-President), not less than	£2
Ordinary Members, not less than	£1
Tenant Farmers (the rateable value of whose holdings does not exceed £200 a-year), not less than	10*s.*

IV. The payment of £20 in one sum shall constitute a Governor for life, and of £10 in one sum an Ordinary Member for life ; but any Governor who has subscribed not less than £2 annually for a period of twenty years may become a Life Governor on the further payment of £10 in one sum ; and any Ordinary Member, who has subscribed not less than £1 annually for the same period may become a Life-Member on the further payment of £5 in one sum.

V. Subscriptions shall become due and be payable in advance on the 1st of January in each year or as soon as the Subscriber has been elected a Member. When the election takes place during the last quarter of the year the subscription payable on election will be considered as applying to the ensuing year.

VI. A Member shall be liable to pay his subscription for the current year unless he shall have given notice, in writing, to the Secretary before January 1st of his intention to withdraw.

GOVERNING BODY.

VII. The entire management of the Society—including the making of Bye-laws, election of Members, determining the Prizes to be awarded, appointing Committees, fixing the Places of Meetings and Exhibitions, appointing or removing the Treasurer, Secretary, and such other officers as may be required to carry on the business of the Society—shall be vested in the Council, who shall report its proceedings at the Annual Meetings of the Society.

VIII. The Council shall consist of the Patron (if any), President, Vice-Presidents, Trustees, and Treasurer (who shall be *ex-officio* Members), and of sixty-six elected Members.

ELECTION OF PRESIDENT, VICE-PRESIDENTS, TRUSTEES, AND COUNCIL.

IX. The election of a President for the year, of any additional Vice-Presidents or Trustees, and of the Members of Council representing the Divisions named in Law X., shall take place at the Annual Meeting of the Society, and they shall enter into office at the conclusion of the Exhibition during which such Annual Meeting has been held.

X. The sixty-six Members of the Council referred to in Laws VIII. and IX. shall consist of fifty-eight persons residing or representing property in the following Divisions, viz. :—

Twelve from the Counties of Devon and Cornwall, which shall be called the Western Division ;

Twenty-four from the Counties of Somerset, Dorset, and Wilts, which shall be called the Central Division ;

Twelve from the Counties of Hants, Berks, Oxon, Bucks, Middlesex, Surrey, Sussex, and Kent, which shall be called the Southern Division ; and

Ten from the Counties of Worcester, Gloucester, Hereford and Monmouth, and the Principality of Wales, which shall be called the North-Western Division.

The remaining eight shall be elected (irrespective of locality) from the general body of members, and shall form a Division which shall be called the "Without Reference to District" Division.

XI. One half of the elected Members in each of the five Divisions named in Law X. shall retire annually by rotation, but shall be eligible for re-election.

XII. The Council shall have power to nominate a President, Vice-Presidents, Trustees, and Members of Council for the approval of the Annual Meeting, and to fill up such vacancies in their own body as are left after the Annual Meeting, or as may from time to time occur during the interval between the Annual Meetings.

XIII. Nominations to offices, election to which is vested in the whole body of Members, must reach the Secretary ten days before the meeting at which such vacancies are to be filled up.

MEETINGS.

XIV. The Annual Meeting of the Society shall take place during the holding of the annual Exhibition.

XV. Special General Meetings of the Society may be convened by the President on the written requisition of not less than three Members of Council ; and all Members shall have ten days' notice of the object for which they are called together.

XVI. No Member of less than three months' standing, or whose subscription is in arrear, shall be entitled to vote at a Meeting.

EXHIBITIONS.

XVII. The Annual Exhibitions of the Society shall be held in different Cities or Towns in successive years.

XVIII. All Exhibitors shall pay such fees as may be fixed by the Council. Members subscribing not less than £1 per annum, who have been elected previous to February 1st, and have paid the subscription for the current year, shall be entitled to exhibit at such reduction in these fees as the Council shall determine.

PRIZES.

XIX. All prizes offered at the cost of the Society shall be open for competition to the United Kingdom.

XX. No person intending to compete for any prize offered at the annual Exhibition shall be eligible to act as a judge or to have any voice in the selection of judges to award the premiums in the department in which he exhibits.

XXI. If it be proved to the satisfaction of the Council that any person has attempted to gain a prize in this, or in any other society, by a false certificate or by a misrepresentation of any kind, such person shall thereupon be, for the future, excluded from exhibiting in this Society.

JOURNAL.

XXII. The Proceedings of the Society, Awards of Prizes, Financial Statements, and Lists of Officers, Governors, and Members, shall be printed annually in the Society's Journal, and every Governor and Member, not in arrear with his subscription, shall be entitled to receive one copy, free of expense, and there shall be an additional number printed for sale.

POLITICS.

XXIII. No subject or question of a political tendency shall be introduced at any Meeting of this Society.

ALTERATIONS IN LAWS.

XXIV. No new General Law shall be made or existing one altered, added to, or rescinded, except at an Annual or Special General Meeting, and then only provided that a statement of particulars, in writing, shall have been sent to the Secretary at least twenty-one days previous to the Meeting at which the question is to be considered.

List of Officers.

1909-1910.

EXETER MEETING.

PATRON.

HIS MOST GRACIOUS MAJESTY THE KING.

PRESIDENT FOR 1909-1910.

THE RIGHT HON. THE EARL OF DARNLEY.

TRUSTEES.

*Bath, The Marquess of, Longleat, Warminster.
Acland, Sir C. T. D., Bart., Killerton, Exeter.
Edwards, C. L. F., The Court, Axbridge, Somerset.

VICE-PRESIDENTS.

*Wales, H.R.H. The Prince of	Sandringham, Norfolk
Acland, Sir C. T. D., Bart.	Killerton, Exeter
*Amherst, Earl	Montreal, Sevenoaks, Kent
*Bath, Marquess of	Longleat, Warminster
*Beaufort, Duke of	Badminton, Chippenham
Benyon, J. Herbert	Englefield House, Reading.
*Clarendon, Earl of	The Grove, Watford
*Clinton, Lord	Heanton Satchville, Dolton, N. Devon
Collins, C. R.	Hartwell House, Exeter
*Coventry, Earl of	Croome Court, Severn Stoke, Worcester
Devonshire, Duke of	Chatsworth, Derbyshire
Digby, Lord	Minterne, Cerne Abbas
*Ducie, Earl of	Tortworth, Falfield, R.S.O.
Edwards C. L. F.	The Court, Axbridge, Somerset
Fitzhardinge, Lord	Cranford, Hounslow
Hobhouse, Right Hon. H.	Hadspen House, Castle Cary
*Jersey, Earl of	Middleton Park, Bicester, Oxon
*Lansdowne, Marquess of, K.G.	Bowood, Calne
*Llewelyn, Sir J. T. D., Bart.	Penllergare, Swansea
Maskelyne, N. Story-, F.R.S.	Basset Down House, Swindon
Moreton, Lord	Sarsden House. Chipping Norton
*Mount-Edgcumbe, Earl of	Mount Edgcumbe, Devonport
Neville-Grenville, R.	Butleigh Court, Glastonbury
Northumberland, Duke of	Albury Park, Guildford

*** Those to whose names an asterisk (*) is prefixed have filled the office of President.

VICE-PRESIDENTS—*continued.*

*ONSLOW, EARL OF, G.C.M.G.	7, Whitehall Place, London, S.W.
*PLYMOUTH, THE EARL OF	Hewell Grange, Bromsgrove
*PORTMAN, VISCOUNT	Bryanston, Blandford
*RADNOR, EARL OF	Longford Castle, Salisbury
SAINT-GERMANS, EARL OF	Port Elliot, Devonport
SHELLEY, SIR J., Bart.	Shobrooke Park, Crediton
SMITH HON. W. F. D., M.P.	Greenlands, Henley-on-Thames
SOMERSET, DUKE OF	Maiden Bradley, Bath
*TREDEGAR, VISCOUNT	Tredegar Park, Newport, Monmouth
WALERAN, LORD	Bradfield, Cullompton
WILLIAMS, E. W.	Herringston, Dorchester

THE LORD WARDEN OF THE STANNARIES.
THE SURVEYOR-GENERAL OF THE DUCHY OF CORNWALL.
THE RECEIVER-GENERAL OF THE DUCHY OF CORNWALL.

*** Those to whose names an asterisk (*) is prefixed have filled the office of President.

MEMBERS OF COUNCIL.

EX-OFFICIO MEMBERS.

THE PATRON.
THE PRESIDENT.

THE VICE-PRESIDENTS.
THE TRUSTEES.
THE TREASURER.

ELECTED MEMBERS.

WESTERN DIVISION (DEVON AND CORNWALL).

(12 *Representatives.*)

Elected in 1908.

Name.	*Address.*
BUCKINGHAM, REV. F. F.	The Rectory, Doddiscombsleigh, Exeter
BYNG, COL. HON. C.	Edymead House, Launceston
GIBBS, A. H.	Pytte, Clyst St. George, Topsham, Devon
MOORE-STEVENS, COL. R. A.	Cross, Torrington, Devon
SMYTHE OSBOURNE, J. S.	Ash, Iddesleigh, Devon
STUDDY, T. E.	Mazonet, Stoke Gabriel, Totnes

Elected in 1909.

Name.	*Address.*
BOSCAWEN, Rev. A. T.	Ludgvan Rectory, Long Rock, R.S.O., Cornwall
BOSCAWEN, HON. J. R. de C.	Tregye, Perranwell, Cornwall
DAW, J. E.	Exeter
LEVERTON, W.	Woolleigh Barton, Beaford, N. Devon
SILLIFANT, A. O.	Culm Leigh, Stoke Canon, Exeter
VOSPER, W. P.	Merafield, Plympton

CENTRAL DIVISION (SOMERSET, DORSET, AND WILTS.)

(24 *Representatives.*)

ALLEN, J. D.	Springfield House, Shepton Mallet
GIBSON, J. T.	Langford. Somerset
HUMPHRIES, S.	Eastfield Lodge, Westbury-on-Trym, Bristol
LLEWELLYN, COL. E. H.	The Court Farm, Langford, Bristol
MAULE, M. ST. J.	Chapel House, Bath
MILES, SIR H., Bart.	Abbotsleigh, Bristol
NAPIER, H. B.	Long Ashton, Clifton, Bristol
PARRY-OKEDEN, LT.-COL. U. E. P.	Turnworth, Blandford, Dorset
SHERSTON, MAJOR C. D.	Evercreech, Bath
SKRINE, COL. H. M.	Warleigh Manor, Bath
TUDWAY, C. C.	The Cedars, Wells, Somt.
WYNFORD, LORD	Wynford House, Maiden Newton, Dorset.
FARWELL, E. W.	11, Laura Place, Bath
GIBBONS, G.	Tunley Farm, near Bath
GLYN R. F.	The Cross House, Fontmell Magna, Shaftesbury, Dorset
GORDON G. H.	The Barn House, Sherborne, Dorset
HURLE, J. C.,	Brislington Hill, Bristol
PHIPPS, C. N. P.	Chalcot, Westbury, Wilts
RAWLENCE, E. A.	Newlands, Salisbury
SHERSTON, C. J. T.	Evercreech, Somerset
SMITH, A. J.	Brooklea, St. Anne's Park, Bristol
SOMERVILLE, A. F.	Dinder House, Wells
STRACHEY, SIR E. Bart, M.P.	Sutton Court, Pensford, Somerset
WHITE, A. R.	Charnage, Mere, Wilts

SOUTHERN DIVISION (HANTS. BERKS, OXON, BUCKS, MIDDLESEX, SURREY, SUSSEX AND KENT.)

(12 *Representatives.*)

BEST, CAPT. T. G.	Redrice, Andover, Hants
INGLIS, J. C.	General Manager, G.W.R., Paddington
JERVOISE, F. H. T.	Herriard Park, Basingstoke
KNOLLYS, C. R.	The Grange, Alresford, Hants
LATHAM, T.	Dorchester, Oxon
RUTHERFORD, J. A.	Highclere Estate Office, Newbury
ASHCROFT, W.	13, The Waldrons, Croydon
COBB, H. M.	Higham, Kent
CUNDALL, H. M., I.S.O., F.S.A.	Richmond, Surrey
DRUMMOND, H. W.	5, Carlos Place, London, W.
MATHEWS, E.	Little Shardeloes, Amersham, Bucks
SUTTON, M. J.	Holme Park, Sonning, Berks

NORTH-WESTERN DIVISION (WORCESTERSHIRE, GLOUCESTERSHIRE, HEREFORDSHIRE, MONMOUTHSHIRE AND WALES.)

(10 *Representatives.*)

BEST, CAPT. W.	Vivod, Llangollen
CHESTER MASTER, COL. T. W.	Knowle Park, Almondsbury
COTTERELL, SIR J., Bart.	Garnons, Hereford
LIPSCOMB, G.	Margam Park Estate Office. Port Talbot
PHILLIPS, C. D.	Newport, Mon.
ALEXANDER, D.	Cardiff
ALEXANDER, H. G.	5, High Street, Cardiff
BAKER, G. E. LLOYD	Hardwicke Court, Gloucester
TAYLOR, H. W.	Showle Court, Ledbury
WEBB, E.	Wordsley, Stourbridge

WITHOUT REFERENCE TO DISTRICT DIVISION.

(8 *Representatives.*)

CARR, RICHARDSON	Estate Office, Tring Park, Tring
ENFIELD, VISCOUNT	Dancer's Hill, Barnet
DRUMMOND Major F. D. W.	Cawdor Estate Office, Carmarthen
LLEWELLYN T. E. L.	Nancegloss, Hea Moor, R.S.O., Cornwall

STANDING COMMITTEES, 1909-1910.

[The President is *ex-officio* Member of all Committees.]

ALLOTMENT.

Edwards, C. L. F., *Chairman.*

Bath, Marquess of
Best, Capt. W.
Gibbons, G.
Napier, H. B.
Sherston, Major C. D.
Sillifant, A. O.
Studdy, T. E.

CONTRACTS.

Napier, H. B., *Chairman.*

Bath, Marquess of
Best, Capt. W.
Daw, J. E.
Edwards, C. L. F.
Miles, Sir H. Bart.
Neville-Grenville, R.
Smith, A. J.
Studdy, T. E.

DAIRY.

Acland, Sir C. T. D., Bart., *Chairman.*

Allen, J. D.
Ashcroft, W.
Boscawen, Rev. A. T.
Carr Richardson
Enfield, Viscount
Gibbons, G.
Gibson, J. T.
Hurle, J. Cooke
Knollys, C. R.
Latham, T.
Llewellyn, Col. E. H.
Mathews, E.
Napier, H. B.
Neville-Grenville, R.
Somerville, A. F.
Strachey, Sir E., Bart. (M.P.)
Tudway, C. C.
White, A. R.

DISQUALIFYING.

The Stewards of Live Stock and Produce.

EXPERIMENTS AND EDUCATION.

Acland, Sir C. T. D., Bart., *Chairman.*

Allen, J. D.
Ashcroft, W.
Baker, G. E. Lloyd
Benyon, J. H.
Gibbons, G.
Gibson, J. T.
Hobhouse, Rt. Hon. H.
Humphries, S.
Hurle, J. Cooke
Knollys, C. R.
Latham, T.
Neville-Grenville, R.
Rawlence, E. A.
Rutherford, J. A.
Smythe-Osbourne, J. S.
Sutton, M. J.

(With power to add to their number.)

FINANCE.

Collins, C. R., *Chairman.*

Napier, H. B.
Gibbs, A. H.
Llewellyn, Col. E. H.

FORESTRY.

Chairman.

Acland, Sir C. T. D., Bart.
Cobb, H. M.
Lipscomb, G.
Dunstan, M. J. R.
Napier, H. B.
North, G. F.
Rutherford, J. A.

IMPLEMENT REGULATIONS.

Shelley, Sir J., Bart., *Chairman.*

Acland, Sir C. T. D., Bart.
Bath, Marquess of
Best, Capt. W.
Edwards, C. L. F.
Gibbons, G.
Moore-Stevens, Col. R. A.
Napier, H. B.
Neville-Grenville, R.
Studdy, T. E.

JOURNAL.

Acland, Sir C. T. D., Bart., *Chairman.*

Baker, G. E. Lloyd
Hobhouse, Right Hon. H.

JUDGES' SELECTION.

Sillifant, A. O., *Chairman.*

Alexander, D.
Allen, J. D.
Ashcroft, W.
Byng, Col. Hon. C.
Gibbons, G.
Latham, T.
Master, Col. T. W. C.
Mathews, E.
Moore-Stevens, Col. R. A.
Parry-Okeden, Lieut.-Col. U. E. P.
Phipps, C. N. P.
Shelley, Sir J., Bart.
Sherston, Major C. D.
Wynford Lord

RAILWAY ARRANGEMENTS AND ADVERTISEMENTS.

, *Chairman.*

Alexander, D.
Amherst, Earl
Coventry, Earl of
Drummond, H. W.
Inglis, J. C.
Llewellyn, Col. E. H.
Phillips, C. D.
Shelley, Sir J., Bart.
Webb, E.

(With power to add to their number.)

SCIENCE AND ART.

Bath, Marquess of, *Chairman.*

Acland, Sir C. T. D., Bart.
Cundall, H. M., I.S.O., (F.S.A.)
Daw, J. E.
Farwell, E. W.
Hobhouse, Rt. Hon. H.
Legard, A. G.
Lipscomb, G.
Llewelyn, Sir J. T. D., Bart.
Napier, H. B.
Rutherford, J. A.

(With power to add to their number.)

SELECTION.

The Chairmen of all other Committees.

SHOW PLACE AND DATE.

Chairmen of the Allotment, Contracts, Dairy, Finance, Implement Regulations, Railway Arrangements, Science and Art, and Stock Prize Sheet Committees.

(With power to add two Local Members to their number.)

STOCK PRIZE SHEET.

Sillifant, A. O., *Chairman.*

Alexander, D.
Allen, J. D.
Ashcroft, W.
Boscawen, Hon. J. R. de C.
Buckingham, Rev. F. F.
Byng, Col. Hon. C.
Cotterell, Sir J., Bart.
Gibbons, G.
Latham, T.
Leverton, W.
Mathews, E.
Miles, Sir H., Bart.
Moore Stevens, Col. R. A.
Shelley, Sir J., Bart.
Sherston, Major C. D.
Vosper, W. P.
Wynford, Lord

WORKS.

EDWARDS, C. L. F., *Chairman.*

BATH, MARQUESS OF
BEST, CAPT. W.
NAPIER, H. B.
STUDDY, T. E.

Stewards.

Cattle, Sheep and Pigs.

SILLIFANT, A. O.
BYNG, COL. HON. C.
ASHCROFT, W.

Cider.

FARWELL, E. W.

Dairy.

GIBBONS, G. KNOLLYS, C. R.

Dairy Tests.

SOMERVILLE, A. F.

Experiments.

ASHCROFT, W.

Finance.

COLLINS, C. R.
NAPIER, H. B.
GIBBS, A. H.
LLEWELLYN, COL. E. H.

Forestry.

LIPSCOMB, G.

Horses.

SHERSTON, MAJOR C. D.
ALEXANDER, D.

Horticulture.

BOSCAWEN, REV. A. T.

Music.

CUNDALL, H. M. (I.S.O., F.S.A.)

Poultry.

BOSCAWEN, HON. J. R. de C.

Science and Art.

CUNDALL, H. M. (I.S.O., F.S.A.)

Shoeing.

LATHAM, T.

Yard.

EDWARDS, C. L. F.
BEST, CAPT. W.
BATH, MARQUESS OF

Other Honorary Officials.

Treasurer—LUTTRELL, C. M. F.

Chaplain.

BOSCAWEN, REV. A. T.

Permanent Officials.

Secretary and Editor—PLOWMAN, THOMAS F.

Associate Editor.

LLOYD, F. J. (F.C.S.)

Auditor.

GOODMAN, F. C. (*Chartered Accountant*)

Consulting Botanist.

PRIESTLEY J. H (B.Sc., F.L.S.).

Consulting Chemist.

VOELCKER, Dr. J. A. (M.A., F.I.C.)

Veterinary Inspector.

PENBERTHY, Prof. J. (F.R.C.V.S.)

Superintendent of Works.

ROSSITER, J.

Annual Exhibitions.

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.		
			Local Committee.	Local Societies	Local Residents.			On 2/6 Days.	On 1/- Days.	Total.
		£	£	£	£	£				
1852	Taunton	210	..	..	..	210	Lord Portman	..	..	..
1853	Plymouth	450	..	..	..	450	Sir T. D. Acland, Bart.	..	..	..
1854	Bath	450	..	..	..	450	William Miles, M.P.	..	..	..
1855	Tiverton	450	..	..	..	450	Earl Fortescue	..	..	..
1856	Yeovil	450	..	..	..	450	C. A. Moody, M.P.	..	..	..
1857	Newton Abbot	700	..	..	..	700	Lord Courtenay	..	..	..
1858	Cardiff	800	..	..	..	800	Lord Courtenay	..	..	..
1859	Barnstaple	800	85	..	81	966	John Sillifant	..	..	..
1860	Dorchester	900	..	..	..	900	Lord Rivers	10,709	11,949	22,658
1861	Truro	900	..	..	..	900	J. W. Buller, M.P.	15,201	14,220	29,421
1862	Wells	900	..	..	..	900	Sir T. D. Acland, Bart.	10,578	4,775	15,353
1863	Exeter	900	..	..	..	900	Marquess of Bath.	15,635	19,284	34,919
1864	Bristol	1000	106	..	50	1156	Earl Fortescue	22,377	65,678	88,055
1865	Hereford	900	358	..	..	1258	Lord Taunton	16,575	35,261	51,836
1866	Salisbury	900	57	..	..	957	Earl of Portsmouth	7,288	18,737	26,025
1867	Salisbury	..					J. Tremayne	7,502	16,702	24,204
1868	Falmouth	900	..	..	..	900	Sir J. T. B. Duckworth, Bart.	11,393	19,495	30,888
1869	Southampton	900	132	..	18	1050	Earl of Carnarvon	15,340	41,290	56,630
1870	Taunton	900	..	..	..	900	Sir S. H. Northcote, Bart., C.B., M.P.	17,952	33,653	51,605
1871	Guildford	900	110	..	..	1010	Earl of Cork	10,656	23,406	34,062
1872	Dorchester	800	..	..	10	810	Duke of Marlborough, K.G.	12,791	21,517	34,308
1873	Plymouth	800	..	400	..	1200	Earl of Mount-Edgcumbe.	16,665	45,744	62,409
1874	Bristol	800	403	..	..	1203	Sir Massey Lopes, Bart., M.P.	37,329	72,791	110,120
1875	Croydon	800	245	..	..	1045	R. Benyon, M.P.	14,518	26,028	40,546
1876	Hereford	800	381	..	..	1181	Earl of Ducie	16,396	32,645	49,041
1877	Bath	800	215	..	..	1015	Marquess of Lansdowne	27,625	48,852	76,477
1878	Oxford	800	..	170	6	976	Earl of Jersey	12,414	26,995	39,409
1879	Exeter	800	..	..	10	810	Earl of Morley	14,634	40,533	55,167
1880	Worcester	800	..	254	..	1054	Earl of Coventry	8,415	37,675	46,090
1881	Tunbridge Wells	800	245	34	..	1079	Marquess of Abergavenny	13,368	33,236	46,604

ANNUAL EXHIBITIONS—*continued.*

Year.	Place Visited.	Local Subscription.	Prizes. Local Committee.	Prizes. Local Societies	Prizes. Local Residents.	Total Local Contribution.	President.	Admissions. On 5/- Day.	Admissions. On 2/6 Days.	Admissions. On 1/- Days.	Admissions. Total.
		£	£.	£	£	£					
1882	Cardiff	800	200	198	17	1215	Lord Tredegar	..	23,941	38,680	62,621
1883	Bridgwater	800	78	..	..	878	Lord Brooke, M.P.	..	17,171	31,241	48,412
1884	Maidstone	800	310	33	75	1218	Viscount Holmesdale	..	13,501	31,053	44,554
1885	Brighton	800	227	33	82	1142	Viscount Hampden	..	9,637	39,851	49,488
1886	Bristol	800	525	..	..	1325	Lord Carlingford	..	29,580	70,999	100,579
1887	Dorchester	800	..	112	..	912	Earl of Ilchester	..	8,860	29,846	38,706
1888	Newport (Mon.)	800	100	..	..	900	Lord Tredegar	..	14,878	38,567	53,445
1889	Exeter	800	..	..	10	810	Lord Clinton	..	16,405	36,195	52,600
1890	Rochester	800	294	..	26	1120	Earl of Darnley	..	3,480	48,314	51,794
1891	Bath	800	50	103	100	1053	Earl Temple	..	23,510	52,185	75,695
1892	Swansea	800	200	100	10	1110	Sir J. D. T. Llewelyn, Bart.	..	18,364	54,609	72,973
1893	Gloucester	800	400	..	..	1200	Lord Fitzhardinge	..	14,272	40,368	54,640
1894	Guildford	800	174	..	10	984	Earl of Onslow	..	8,671	29,813	38,484
1895	Taunton	800	85	160	10	1055	Viscount Portman	..	13,181	30,111	43,292
1896	St. Albans	800	152	..	..	952	Earl of Clarendon	..	12,056	22,380	34,436
1897	Southampton	800	50	..	..	850	Lord Montagu of Beaulieu	..	8,284	33,750	42,034
1898	Cardiff	800	200	..	..	1000	Lord Windsor	..	13,101	42,501	55,602
1899	Exeter	800	..	225	5	1030	Lord Clinton	..	16,091	39,832	55,923
1900	Bath	800	100	150	10	1060	Marquess of Bath	954	11,601	36,814	49,369
1901	Croydon	800	115	..	..	915	H.R.H. The Duke of Cornwall and York, K.G.	1,196	9,362	30,693	41,251
1902	Plymouth	800	105	100	36	1041	Earl of Morley	842	12,629	40,565	54,036
1903	Bristol	800	434	50	61	1345	Duke of Beaufort	..	34,528	74,352	108,880
1904	Swansea	800	350	..	..	1150	Lord Windsor	..	28,265	50,562	78,827
1905	Nottingham	800	..	218	..	1018	Duke of Portland, K.G.	..	8,913	45,964	54,877
1906	Swindon	800	..	200	50	1050	Earl of Radnor	..	7,838	42,013	49,851
1907	Newport (Mon.)	800	201	51	29	1081	H.R.H. The Prince of Wales, K.G.	..	16,236	37,819	54,055
1908	Dorchester	800	100	25		925	Lord Digby	..	12,227	20,350	32,577
1909	Exeter	800	..	100	..	900	Lord Clinton	..	14,898	41,891	56,789
1910	Rochester and Chatham	800	117			917	Earl of Darnley	..			

Members' Privileges.

ANALYSES OF FERTILISERS, FEEDING STUFFS, WATERS, SOILS, &c.

(*Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis*).

Members of the Bath and West and Southern Counties Society, who may also be Members of other Agricultural Societies, are particularly requested, in applying for Analyses, to state that they do so as Members of the first-named Society.

THE Council have fixed the following rates of Charges for Chemical Analyses to Members of the Society.

These privileges are applicable only when the analyses are for *bona-fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

Land or estate agents, bailiffs, and others, when forwarding samples are required to state the names of those Members on whose behalf they apply.

Members are also allowed to send for analysis under these privileges any manures or feeding-stuffs to be used by their outgoing tenants, or which are to be given free of cost to their occupying tenants.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Members are requested, when applying for an analysis, to quote the number in the subjoined schedule under which they wish it to be made.

No.		
1.	—An opinion of the purity of bone-dust or oil-cake (each sample)	2*s*. 6*d*.
2.	—An analysis of sulphate or muriate of ammonia, or of nitrate of soda, together with an opinion as to whether it be worth the price charged	5*s*.
3.	—An analysis of guano, showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, together with an opinion as to whether it be worth the price charged	10*s*.
4.	—An analysis of mineral superphosphate of lime for soluble phosphates only, together with an opinion as to whether it be worth the price charged	5*s*.
5.	—An analysis of superphosphate of lime, dissolved bones, &c., showing the proportions of moisture, organic matter, sand, soluble and insoluble phoshates, sulphate of lime, and ammonia, together with an opinion as to whether it be worth the price charged	10*s*.
6.	—An analysis of bone-dust, basic slag, or any other ordinary artificial manure, together with an opinion as to whether it be worth the price charged	10*s*.
7.	—An analysis of compound artificial manures, animal products, refuse substances used for manure, &c.	from 10*s*. to £1
8.	—An analysis of limestone, showing the proportion of lime	7*s*. 6*d*.
9.	—An analysis of limestone, showing the proportion of lime and magnesia ..	10*s*.
10.	—An analysis of limestone or marls, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay	10*s*.
11.	—Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime	£1
12.	—Complete analysis of a soil	£3
13.	—An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre as well as of starch, gum, and sugar in the aggregate; and an opinion of its feeding and fattening or milk-producing properties..	10*s*.
14.	—Analysis of any vegetable product	10*s*.
15.	—Determination of the "hardness" of a sample of water before and after boiling	5*s*.
16.	—Analysis of water of land-drainage, and of water used for irrigation	£1
17.	—Analysis of water used for domestic purposes	£1 10*s*.
18.	—An analysis of milk (to assist Members in the management of their Dairies and Herds, *bona-fide* for their own information and not for trade purposes, nor for use in connection with the Sale of Food and Drugs Acts)	5*s*.
19.	—Personal consultation with the Consulting Chemist. (To prevent disappointment it is suggested that Members desiring to hold a consultation with the Consulting Chemist should write to make an appointment)	5*s*.
20.	—Consultation by letter	5*s*.
21.	—Consultation necessitating the writing of three or more letters	10*s*.

Members wishing to exercise their privileges on the above-named terms, should forward their samples for examination *by post or parcel prepaid*, to the Consulting Chemist, DR. JOHN AUGUSTUS VOELCKER, M.A., F.I.C., 22, Tudor Street, New Bridge Street, London, E.C.

The fees for analysis must be sent to the Consulting Chemist at the time of application.

GUIDE TO PURCHASERS OF FERTILISERS AND FEEDING STUFFS.

Purchasers are recommended in every case to insist upon having an *Invoice* given to them. This invoice should set out clearly :—

In the case of **Fertilisers**—
(1.) the **name** of the fertiliser ;
(2.) whether the fertiliser be artificially **compounded** or not ;
(3.) the **analysis** guaranteed in respect of the principal fertilising ingredients.

In the case of **Feeding-Stuffs**—
(1.) the **name** of the article ;
(2.) the **description** of the article ; whether it has been made from one substance or seed only, or from more than one.
(3.) the **analysis** guaranteed in respect of Oil and Albuminoids.

(Note.—The use of the terms "Linseed-cake," "Cotton-cake," &c., implies that these cakes shall be "pure," and purchasers are recommended to insist upon these terms being used without any qualification such as "95 per cent.," "as imported," &c. "Oil-cake" should be avoided.

Members of the Society should see that the **Invoices** agree accurately with the orders given by them, and, in giving these orders, they should stipulate that the goods come up to the guarantees set out in the following list, and that they be sold **subject to the analysis and report of the Consulting Chemist of the Bath and West and Southern Counties Society.**

FERTILISERS.

Raw Bones, Bone-meal, or **Bone-dust** to be guaranteed "pure," and to contain not less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of Ammonia.

Steamed or "**Degelatinised**" **Bones** to be guaranteed "pure," and to contain not less than 55 per cent. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

Mineral Superphosphate of Lime to be guaranteed to contain a certain percentage of "Soluble Phosphate." [From 25 to 28 per cent. of Soluble Phosphate is an ordinarily good quality.]

Dissolved Bones to be guaranteed to be "made from raw bone and acid only," and to be sold as containing stated percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia.

Compound Artificial Manures, Bone Manures, Bone Compounds, &c., to be sold by analysis stating the percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia contained.

Basic Slag to be guaranteed to contain a certain percentage of Phosphoric Acid, and to be sufficiently finely ground that 80 to 90 per cent. passes through a sieve having 10,000 meshes to the square inch.

Peruvian Guano to be described by that name, and to be sold by analysis stating the percentages of Phosphates and Ammonia.

Sulphate of Ammonia to be guaranteed to be "pure," and to contain not less than 24 per cent. of Ammonia.

Nitrate of Soda to be guaranteed to be "pure," and to contain 95 per cent. of Nitrate of Soda.

Kainit to be guaranteed to contain 23 per cent of Sulphate of Potash.

All fertilisers to be delivered in good and suitable condition for sowing.

FEEDING-STUFFS.

Linseed Cake, Cotton Cake (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, i.e., prepared *only* from one kind of seed from which their name is derived, and to be in sound condition. The report of the Consulting Chemist of the Bath and West and Southern Counties Society to be conclusive as to the " purity " or otherwise of any feeding-stuffs. The percentages of Oil and Albuminoids must also be guaranteed.

Mixed Feeding Cakes, Meals, &c., to be sold on a guaranteed analysis.

All Feeding-Stuffs to be sold in sound condition, and to contain nothing of an injurious nature or worthless for feeding purposes.

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

GENERAL RULES.

1.—A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.

2.—The sample should reach the Analyst *in the same condition* as it was at the time when drawn.

FERTILISERS.

When **Fertilisers** are delivered in bags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each bag and draw out from as near the centre as possible a couple of shovelfuls of the manure, and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one-half (rejecting the other) and mix again rapidly, flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from $\frac{1}{2}$ lb. to 1 lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass bottles provided with well-fitting corks; the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, sub-divided, and, finally, samples should be taken as before, except that when the manure is coarse and bulky it is advisable to send larger samples than when it is in a finely-divided condition.

FEEDING-STUFFS.

Linseed, Cotton, and other Feeding Cakes.—If a single cake be taken three strips should be broken off right across the cake and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of the delivery, then break off a piece about four inches wide from the middle of each cake, and pass these pieces through a cake-breaker. The broken cake should then be well mixed, and three samples of about 1 lb. each should be taken and put in tins or bags duly marked, fastened, and sealed as before. One of these lots

should be sent for anaylsis, the remaining two being kept for reference. It is advisable, also, with the broken pieces, to send a small strip from an unbroken cake.

Feeding Meals, Grain, &c.—Handfuls should be drawn from the centre of half-a-dozen different bags of the delivery; these lots should then be well mixed, and three ½ lb. tins or bags filled from the heap, each being marked, fastened up, and sealed. One sample is to be forwarded for analysis and the others retained for reference.

SOILS, WATERS, &c.

Soils.—Have a wooden box made, 6 inches in length and width, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil and its subsoil 9 to 12 inches deep; trim this block to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up gently, turn over the box, nail on the lid, and send by rail. The soil will then be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

Waters.—Samples of water are best sent in glass-stoppered Winchester bottles holding half a gallon. One such bottle is sufficient for a single sample. Care should be taken to have these scrupulously clean. In taking a sample of water for analysis it is advisable to reject the first portion drawn or pumped, so as to obtain a sample of the water when in ordinary flow. The bottle should be rinsed out with the water that is to be analysed, and it should be filled nearly to the top. The stopper should be secured with string, or be tied over with linen or soft leather. The sample can then be sent carefully packed either in a wooden box with sawdust, &c., or in a hamper with straw.

Milk.—A pint bottle should be sent in a wooden box.

GENERAL INSTRUCTIONS.

Time for Taking Samples.—All samples, both of fertilisers and feeding-stuffs, should be taken as soon after their delivery as possible, and should reach the Analyst within *ten days* after delivery of the article. In every case it is advisable that the Analyst's certificate be received before a fertiliser is sown or a feeding-stuff is given to stock.

Procedure in the event of the Vendor wishing Fresh Samples to be Drawn.—Should a purchaser find that the Analyst's certificate shows a fertiliser or feeding-stuff not to come up to the guarantee given him, he may inform the vendor of the result and complain accordingly. He should then send to the vendor *one* of the two samples which he has kept for reference. If, however, the vendor should demand that a fresh sample be drawn, the purchaser must allow this, and also give the vendor an opportunity of being present, either in person or through a representative whom he may appoint. In that case, three samples should be taken in the presence of both parties with the same precautions as before described, *each* of which should be duly packed up, labelled and *sealed* by both parties. One of these is to be given to the vendor, one is to be sent to the Analyst, and the third is to be kept by the purchaser for reference or future analysis if necessary.

All samples intended for the Consulting Chemist of the Society should be addressed (postage or carriage prepaid) to Dr. J. AUGUSTUS VOELCKER, M.A., F.I.C., 22, Tudor Street, New Bridge Street, London, E.C. Separate letters of instruction should be sent at the same time.

Members' Privileges.

EXAMINATION OF PLANTS AND SEEDS.

THE Council have arranged for the following rates of charge for the examination by the Society's Consulting Botanist of Plants and Seeds for the *bona-fide* and individual information and benefit of Members of the Society (not being seedsmen). The charge for examination must be paid at the time of application and the carriage of all parcels must be prepaid. Members of the Society desirous of personally interviewing the Consulting Botanist can make an appointment with him at the University of Bristol (University Road, just above the top of Park Street) by letter. To prevent disappointment, all applications for an interview should reach the Consulting Botanist two days before the interview is desired. No appointments can be made for the month of August, but samples or specimens sent during that month will be dealt with as usual.

No.		
1.—	A report on the purity and germinating power of a sample of seed, stating the sorts and amount of any other seeds found therein	1s.
2.—	Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention	1s.
3.—	Report on any disease affecting farm crops	1s.
4.—	Determination of the species of a collection of natural grasses found in any district with a report on their habits and pasture value	5s.

N.B.—The Consulting Botanist's Reports on Seeds are furnished to enable Members—purchasers of seeds and corn for Agricultural or Horticultural purposes—to test the value of what they buy, and not to be used or made available for advertising or trade purposes.

PURCHASE OF SEEDS.

The purchaser should obtain from the vendor, by invoice or otherwise, a proper designation of the seed he buys, with a guarantee that it contains not more than a specified amount of other seeds and is free from ergot, or in the case of clovers, from dodder, and of the percentage of seeds that will germinate.

The germination of cereals, green crops, clover, and timothy grass should be not less than 90 per cent. ; of fox-tail not less than 60 per cent. ; of other grasses not less than 70 per cent.

The Council strongly recommend that the purchase of prepared mixtures should be avoided, and that the different seeds to be sown should be purchased separately.

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES.

I. SEEDS.

In sending seed or corn for examination the utmost care must be taken to secure a fair and honest sample. In the case of grass-seeds the sample should be drawn from the centre of the sack or bag, and in all cases from the bulk delivered to the purchaser and not from the purchase sample. When bought by sample, the whole or part of that sample should also be sent.

When it is considered necessary to secure legal evidence the sample should be taken from the bulk and placed in a sealed bag in the presence of a reliable witness who is acquainted with the identity of the bulk, and care should be taken that the purchased sample and bulk be not tampered with after delivery, or mixed or come in contact with any other sample or stock.

One ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. The exact name under which the seed has been bought should be sent with it.

Grass-seeds should be sent at least FOUR WEEKS, *and clover-seeds* TWO WEEKS *before they are required and they should not be sown until the report has been received.*

II. PLANTS.

In collecting specimens of plants, the whole plant should be taken up and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. They should be placed in a bottle, or packed in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required and stating any local circumstances (soil, situation, &c.), which, in the opinion of the sender, would be likely to throw light on the inquiry.

To avoid delay parcels or letters containing seeds or plants for examination (carriage or postage prepaid) must be addressed to Mr. J. H. PRIESTLEY, B.Sc., F.L.S., The University, Bristol, and be marked "Bath and West Society."

ROCHESTER AND CHATHAM MEETING,

MAY 24, 25, 26, 27 and 28, 1910.

LIST OF JUDGES.

HORSES.

Agricultural.—W. Richardson, Doddington, March, Cambs.
Hunters.—Rev. E. A. Milne, Chilfrome, Dorchester.
Hackneys.—A. Rowell, West Rudham, King's Lynn.
Ponies.—Rev. E. A. Milne, Chilfrome, Dorchester.
Harness.—J. Hornsby, Laxton Park, Stamford.
Jumping.—Rev. E. A. Milne, Chilfrome, Dorchester.

CATTLE.

Devon.—W. J. Chick, Stratton, Dorchester.
South Devon.—B. Trant, Trethawlo, Liskeard, Cornwall.
Shorthorn.—R. Stratton, The Duffryn, Newport, Mon.
Hereford.—J. H. Yeomans, Withington, Hereford.
Sussex.—E. E. Braby, Drungewick Manor House, Rudgwick, Sussex.
Aberdeen Angus.—C. W. Schroeter, Bella Vista, Hayward's Heath.
Jersey.—J. A. Falle, Faldonet Farm, Gorey, Jersey.
Guernsey.—A. Baillie Hamilton, Burley Lodge, Ringwood, Hants.
Kerry and Dexter —Geo. F. Roumieu, Bethune House, Farnham, Surrey.

SHEEP.

South Devon.—J. Hoare, Mount Barton, Staverton, Totnes.
Kent or Romney Marsh.—A. Amos, Spring Grove Farm, Wye, Kent.
Southdown.—A. Cooper, Norton, Bishopstone, Lewes.
Hampshire Down.—H. Lambert, Babraham, near Cambridge.
Shropshire.—T. S. Minton, Montford, Shrewsbury.
Oxford Down.—J. P. Case, Binham Abbey, Norfolk.
Dorset Down.—W. W. Lovelace, Piddlehinton, Dorchester.
Dorset Horn.—C. Hawkins, Waddon, Dorchester.

PIGS.

Berkshire.—J. A. Fricker, Suddon Grange, Wincanton.
Large Black.—J. H. Glover, Cornwood, South Devon.
Large and Middle White, and Tamworth—S. Heaton, Worsley, Manchester.

POULTRY.

T. C. Heath, Keele, Newcastle, Staffs. (Classes 1 to 26, 51 and 56 to 71).
W. Smith Lambert, Harlow Court Farm, Harrogate. (Classes 1 and 27 to 71).

PRODUCE.

Cider.—T. B. Richards, Huxham, Shepton Mallet.
Cheese.—H. M. J. Underhill, 7, High Street, Oxford.
Cream Cheese, Butter and Cream.—Prof. Carroll, 1, Rostrevor Terrace, Rathgar, Dublin.
Hops.—Messrs. Jackson, B. Noakes, S. Neame, E. Le May and T. Parkes.

COMPETITIONS.

Butter-Making.—Prof. Carroll, 1, Rostrevor Terrace, Rathgar, Dublin ; and Miles Benson, British Dairy Institute, Reading.
Milking.—G. Alexander, The Barns, Old Church Road, Stepney, London, E.
Shoeing.—F. Bazley, F.R.C.V.S., 5, Estcourt Street, Devizes, Wilts.

FORESTRY.

G. Marshall, Estate Office, Godalming ; G. E. Champion, Linton Park Estate Office, Maidstone ; and E. S. Salmon, South Eastern Agricultural College, Wye.

MONEY PRIZES.

	£	s.	d.		PAGE
Horses	808	0	0	..	cx
Cattle	1,193	0	0	..	cxv
Sheep	517	0	0	..	cxix
Pigs	227	10	0	..	cxxi
Hops	65	0	0	..	cxxiii
Wool	7	0	0	..	cxxiii
Cheese	81	10	0	..	cxxiv
Cream Cheese, Butter and Cream	67	10	0	..	cxxiv
Butter-Making	38	0	0	..	cxxv
Milking	11	5	0	..	cxxv
Shoeing	70	10	0	..	cxxv
Poultry	167	10	0	..	cxxxv
	£3,253	15	0		

DONORS OF MONEY PRIZES.

	£	s.	d.
Bath and West and Southern Counties Society ..	2,775	5	0
Rochester and Chatham Local Committee ..	117	0	0
Shire Horse Society	5	0	0
Hackney Horse Society (or Medal)	5	0	0
Lord Tredegar	12	0	0
Members of South Devon Herd Book Society (per W. P. Vosper, Esq.)	17	0	0
Shorthorn Society	20	0	0
The Dairy Shorthorn (Coates's Herd Book) Association	10	0	0
Hereford Herd Book Society	20	0	0
Sussex Herd Book Society	17	0	0
English Aberdeen Angus Cattle Association ..	10	0	0
English Jersey Cattle Society	41	0	0
English Guernsey Cattle Society	18	0	0
English Kerry and Dexter Cattle Society ..	20	0	0
Kent or Romney Marsh Sheep Breeders' Association	25	0	0
Southdown Sheep Society	17	0	0
Hampshire Down Sheep Breeders' Association ..	10	0	0
Oxford Down Sheep Breeders' Association ..	10	0	0
Dorset Down Sheep Breeders' Association ..	40	0	0
Dorset Horn Sheep Breeders' Association ..	5	0	0
British Berkshire Society	5	0	0
Large Black Pig Society	22	10	0
Kent County Education Committee	32	0	0
	£3,253	15	0

DONORS OF MEDALS, PLATE, &c.

Shire Horse Society.
Hunters' Improvement Society.
Hackney Horse Society.
Polo and Riding Pony Society.
Alderman Whyman.
Chas. Tuff, Esq.
Ladies of Rochester and Chatham.
Sussex Herd Book Society.
Aberdeen Angus Cattle Society.
English Aberdeen Angus Cattle Association.
B. de Bertodano, Esq.
English Kerry and Dexter Cattle Society.
English Jersey Cattle Society.
Southdown Sheep Society.
National Pig Breeders' Association.
British Tamworth Pig Breeders' Association.
Poultry Club.
Bath and West Society.

PRIZES

An Animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of those Prizes headed as Champion or Special Prizes.

HORSES.

SHIRE.

(Registered or eligible for registration in the Shire Horse Society's Stud Book.)

Class	First Prize.	Second Prize.	Thrd Prize
	£	£	£
1.—Stallion, foaled before 1908	15	10	3
2.—Stallion, foaled in 1908	15	10	3
3.—Colt, foaled in 1909	15	10	3
4.—Mare and Foal, or in-Foal	15	10	3
5.—Filly or Gelding, foaled in 1907	10	5	3
6.—Filly or Gelding, foaled in 1908	10	5	3
7.—Filly or Gelding, foaled in 1909	10	5	3
SPECIAL PRIZES.			
(Offered by the Shire Horse Society.)			
A Gold Medal, value £10, for Best MARE or FILLY in the Shire Horse Classes, under Condition 48, and to the Breeder of the Winner under the Conditions stated, a prize of	5		

HORSES—*continued.*

HUNTERS.

Class	First Prize.	Second Prize.	Thrd Prize
	£	£	£
8.—Mare and Foal, or in-Foal	15	10	3
9.—Mare or Gelding, foaled before 1906 . . .	15	10	3
10.—Mare or Gelding, foaled in 1906	15	10	3
11.—Filly or Gelding, foaled in 1907	15	10	3
12.—Filly or Gelding, foaled in 1908	10	5	3
13.—Filly, Colt or Gelding, foaled in 1909 . .	10	5	3

SPECIAL PRIZES.

(Offered by the Hunters' Improvement Society, under Condition 49.)

A Gold Medal, or £5 and a Bronze Medal, for the Best Hunter Brood Mare in Class 8 actually registered with a number in the Hunter Stud Book, at the time of the award, not having previously won the Hunters' Improvement Society's Gold Medal as a Brood Mare in 1910, and which must produce a living foal in 1910, or have her foal at foot. In the first instance a certificate to that effect must be forwarded before the Medal is sent. Only Prize Winners in the Class will be eligible for the Medal.

A Silver Medal or £1 (at the option of the Winner), for the Best Hunter Mare or Gelding of any age, not having previously won the Society's Silver Medal under this scheme in 1910, bred by a Thoroughbred or Registered Hunter Sire and out of a Registered Mare or a Mare registered in Volume 5 of the Hunter Stud Book, under Condition 50. Only Prize winners in the Classes will be eligible for the Medal.

HACKNEYS.

(Registered or eligible for registration in the Hackney Horse Society's Stud Book.)

	First Prize	Second Prize	Third Prize
14.—Mare and Foal, or in-Foal	15	10	3
15.—Mare or Gelding, foaled before 1906 . . .	10	5	3
16.—Mare or Gelding, foaled in 1906 or 1907 . .	10	5	3
17.—Filly or Gelding, foaled in 1908	10	5	3
18.—Filly, Colt or Gelding, foaled in 1909 . .	10	5	3

SPECIAL PRIZE.

(Offered by the Hackney Horse Society.)

A Silver Medal for the Best Mare or Filly exhibited in Classes 14 to 18, under Conditions 51.

	First Prize.	Second Prize.	Thrd Prize
HORSES—*continued.*	£	£	£
PONIES.			
(Of the Prizes offered in Classes 19 to 22, £12 is contributed by Lord Tredegar.)			
CLASS			
19.—STALLION, not exceeding 14.2 hands, suitable to get Polo or Riding Ponies	6	4	2
20.—MARE, not exceeding 14.2 hands, suitable to breed Polo or Riding Ponies, in-foal, or with foal at foot	6	4	2
21.—FILLY, COLT or GELDING, foaled in 1907, not exceeding 14.2 hands	6	4	2
22.—FILLY, COLT or GELDING, foaled in 1908, not exceeding 14.0 hands	6	4	2

SPECIAL PRIZES.

(Offered by the Polo and Riding Pony Society.)

A Silver Medal for the best Polo Pony Brood Mare, registered or eligible for registration in the Stud Book.

A Silver Medal for the best Polo Pony Stallion, registered or eligible for registration in the Stud Book ; or best Polo Pony Entire Colt, entered or eligible for the Supplement, one, two, or three years old.

A Silver Medal for the Best Polo and Riding Pony not exceeding 14.2 hands, with Hurlingham certificate or confirmed by that of a qualified Veterinary Surgeon, owned by a Member of the Polo and Riding Pony Society, such Member to have paid his subscription not later than 14 days after the award.

A Bronze Medal for the best Foal, entered or eligible for the Supplement.

(These Medals are offered subject to Condition No. 53.)

HARNESS.

ENTRIES CLOSE { With boxes—March 24, or at double fees March 31.
Without Boxes—May 5.

Horses entered in the other Classes can, if eligible, be also entered on payment of an additional fee, in the Harness Classes.

Horses entered in the Double Harness and Tandem Classes can also be entered on payment of an additional fee, in the single Harness Classes.

Horses entered in the Harness Classes **only** and not having a box in the Yard, must be in the Show Yard by 2 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as the class has been judged.

	First Prize.	Second Prize.	Thrd Prize
23.—MARE or GELDING, not over 14.2 hands, to be driven in harness on the 1st day of the Show .	10	5	2

	First Prize.	Second Prize.	Thrd Prize
HORSES—*continued.*	£	£	£
CLASS			
24.—TANDEMS (Mares or Geldings), to be driven in harness on the 1st day of the Show . . .	10	5	2
25.—MARE OR GELDING, 15 hands or over, to be driven in harness on the 2nd day of the Show . . .	10	5	2
26.—PAIR OF CARRIAGE HORSES (Mares or Geldings), to be driven in double harness on the 2nd day of the Show	10	5	2
27.—MARE OR GELDING, over 14.2 and under 15 hands, to be driven in harness on the 3rd day of the Show .	10	5	2
28.—TROTTING. Best MARE, STALLION, OR GELDING under 15 hands, for speed and action, to be driven in harness on the 3rd day of the Show . .	10	5	2
The exhibits in Classes 29 to 32 must be the bona fide property of a Tradesman, either resident in or carrying on business within the limits of the City of Rochester, the Borough of Chatham, or the Borough of Gillingham, used solely and constantly for trade purposes, and must have been in Exhibitor's possession for at least 2 months prior to the date of the Show.			
The 1st Prize in Class 29 is offered by Alderman Whyman, Chatham, and the 2nd and 3rd prizes by the Rochester and Chatham Local Committees.			
29.—Light Mare or Gelding, under 14 hands, to be driven in single harness in the owner's business vehicle on the 4th day of Show.	**Cup value 5**	3	2
The 1st Prize in Class 30 is offered by Mr. Charles Tuff, and the 2nd and 3rd Prizes by the Local Committee.			
The same animals cannot compete in Classes 30 and 31.			
30.—Light Mare or Gelding, 14 hands and over, to be driven in single harness in the owner's business vehicle on the 4th day of Show.	**Cup value 5**	3	2
The 1st Prize in Class 31 is offered by ladies of the district, and the 2nd and 3rd Prizes by the Local Committee.			
31.—Mare or Gelding, suitable for heavy Van Work, to be driven in single harness in the owner's business vehicle on the 4th day of Show.	**Cup value 5**	3	2
The 1st Prize in Class 32 is offered by Mr. Charles Tuff, and the 2nd and 3rd Prizes by the Local Committee.			
32.—Pair of Mares or Geldings, for heavy Van Work, to be driven in double harness in the owner's business vehicle on the 4th day of Show.	**Cup value 5**	3	2

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HORSES—*continued.*	First Prize.	Second Prize.	Thrd Prize
	£	£	£
CLASS			
Champion Prizes offered by the Bath and West Society.			
Best exhibit in Classes 29 or 30	5		
Ditto ditto 31 or 32 . . .	5		
33.—MARE or GELDING, not over 13.2 hands, to be driven in harness on the 5th day of the Show . .	10	5	2
34.—TROTTING. Best MARE, STALLION or GELDING, 15 hands or over, for speed and action, to be driven in harness on the 5th day of the Show . .	10	5	2
(Special Prize offered by the Hackney Horse Society.)			
A Prize of £5 or a Gold Medal for the Best Mare or Gelding exhibited in Single Harness in Classes 23 to 34, subject to Condition 52	5		
JUMPING.			
(For Regulations as to Jumping Classes see Condition 54.)			
ENTRIES CLOSE { With Boxes—March 24, or at double fees March 31. Without Boxes—May 5.			
Horses can be entered in as many Jumping Classes as they are eligible for on payment of the entry fee for each Class, but cannot take more than one First Prize.			
Horses entered in the Jumping Classes **only**, and not having a box in the Yard, must be in the Show Yard by 2 p.m. on the day on which they compete and, with the consent of the Stewards, may leave the Yard as soon as the Class has been judged.			
35.—MARE or GELDING, 15 hands and over, that shall jump in the best form on the 1st day of the Show .	10	5	2
36.—MARE or GELDING, under 15 hands, ditto, ditto .	10	5	2
37.—MARE or GELDING, 15.3 hands and over, that shall jump in the best form on the 2nd day of the Show	10	5	2
38.—MARE or GELDING, under 15.3 hands, ditto, ditto .	10	5	2
39.—MARE or GELDING, 15 hands and over, that shall jump in the best form on the 3rd day of the Show	10	5	2
40.—MARE or GELDING, under 15 hands, ditto, ditto .	10	5	2
41.—MARE or GELDING, 15.3 hands and over, that shall jump in the best form on the 4th day of the Show	10	5	2
42.—MARE or GELDING, under 15.3 hands, that shall jump in the best form on the 4th day of the Show	10	5	2
43.—MARE or GELDING, 15 hands and over, that shall jump in the best form on the 5th day of the Show	10	5	2
44.—MARE or GELDING, under 15 hands, that shall jump in the best form on the 5th day of the Show	10	5	2

CATTLE.	First Prize. £	Second Prize. £	Thrd Prize £
DEVON.			
Class			
45.—Cow, in-Milk, calved before 1907	10	5	2
46.—Heifer, in-Milk, calved in 1907	10	5	2
47.—Heifer, calved in 1908	10	5	2
48.—Heifer, calved in 1909	10	5	2
49.—Bull, calved in 1906 or 1907	10	5	2
50.—Bull, calved in 1908	10	5	2
51.—Bull, calved in 1909	10	5	2
SOUTH DEVON.			
(£17 towards the Prizes in the South Devon Classes are contributed by Members of the South Devon Herd Society Book.)			
52.—Cow, in-Milk, calved before 1907	10	5	2
53.—Heifer, in-Milk, calved in 1907	10	5	2
54.—Heifer, calved in 1908	10	5	2
55.—Heifer, calved in 1909	10	5	2
56.—Bull, calved in 1906 or 1907	10	5	2
57.—Bull, calved in 1908	10	5	2
58.—Bull, calved in 1909	10	5	2
SHORTHORN.			
The 1st Prize in Class 59 is offered by the Shorthorn Society, and the 1st Prize in Class 60 by the Dairy Shorthorn (Coates's Herd Book) Association.			
59.—Pedigree Dairy Cow, in-Milk, four years old and upwards on May 24, eligible for, and entered in Coates's Herd Book, or pedigree sent for such entry previous to the Show, and not having previously won a similar prize offered by the above-named Society or Association in 1910, to be milked in the ring before judging, under Conditions 63 .	10	5	
60.—Ditto under four years old ditto ditto .	10	5	
61.—Cow, in-Milk, calved before 1907	10	5	2
62.—Heifer, in-Milk, calved in 1907	10	5	2
63.—Heifer, calved in 1908	10	5	2
64.—Heifer, calved in 1909	10	5	2
65.—Bull, calved in 1906 or 1907	10	5	2
66.—Bull, calved in 1908	10	5	2
67.—Bull, calved in 1909	10	5	2
CHAMPION PRIZE.			
(Offered by the Shorthorn Society.)			
Best Bull in Class 65, 66 or 67, entered in, or eligible for entry in, Coates's Herd Book	10		

	First Prize.	Second Prize.	Thrd Prize
CATTLE—*continued.*	£	£	£
HEREFORD.			
CLASS			
68.—Cow, in-Milk, calved before 1907	10	5	2
69.—HEIFER, in-Milk, calved in 1907	10	5	2
70.—HEIFER, calved in 1908	10	5	2
71.—HEIFER, calved in 1909	10	5	2
72.—BULL, calved in 1906 or 1907	10	5	2
73.—BULL, calved in 1908	10	5	2
74.—BULL, calved in 1909	10	5	2
CHAMPION PRIZES.			
(Offered by the Hereford Herd Book Society.)			
Best Cow or Heifer in Classes 68 to 71 . . .	**10**		
Best Bull in Classes 72 to 74	**10**		
SUSSEX.			
(£17 towards the Prizes in the Sussex Classes are contributed by the Sussex Herd Book Society.)			
75.—Cow, in-Milk, calved before 1907 . . .	10	5	2
76.—HEIFER, in-Milk, calved in 1907 . . .	10	5	2
77.—HEIFER, calved in 1908	10	5	2
78.—HEIFER, calved in 1909	10	5	2
79.—BULL, calved in 1906 or 1907	10	5	2
80.—BULL, calved in 1908	10	5	2
81.—BULL, calved in 1909	10	5	2
SPECIAL PRIZES.			
(Offered by the Sussex Herd Book Society.)			
A Silver Medal for the Best Cow or Heifer, in Classes 75 to 78.			
A Silver Medal for the Best Bull, not exceeding 3 years old, in Classes 79 to 81.			
ABERDEEN ANGUS.			
(The 1st Prize in Class 82 is offered by the English Aberdeen Angus Cattle Association.)			
82.—Cow or HEIFER, in-Milk, calved before 1st Dec., 1907	10	5	2
83.—HEIFER, calved on or after 1st Dec., 1907 . .	10	5	2
84.—HEIFER, calved on or after 1st Dec., 1908 . .	10	5	2
85.—BULL, calved before Dec. 1, 1908	10	5	2
86.—BULL, calved on or after Dec. 1, 1908 . . .	10	5	2

CATTLE—*continued.*	First Prize.	Second Prize.	Thrd Prize
	£	£	£
CHAMPION PRIZES.			
(Offered by the Aberdeen Angus Cattle Society.)			
A Gold Medal for the Best Animal in Classes 82 to 86			
(Offered by the English Aberdeen Angus Cattle Association.)			
A Silver Medal for the Best Animal of opposite Sex to that awarded the Gold Medal in Classes 82 to 86.			
JERSEY.			
(The Prizes in Class 87 are offered by the English Jersey Cattle Society.)			
CLASS			
87.—Cow or Heifer, in-Milk, entered or eligible for entry in the English Jersey Herd Book, bred by Exhibitor, and sired in Great Britain or Ireland .	**5**	**3**	**2**
88.—Cow, in-Milk, calved before 1907	10	5	2
89.—Cow or HEIFER, in-Milk, calved in 1907 .	10	5	2
90.—HEIFER, in-Milk, calved in or since 1908 . .	10	5	2
91.—HEIFER, calved in 1909	10	5	2
92.—BULL, calved in 1906 or 1907	10	5	2
93.—BULL, calved in 1908	10	5	2
94.—BULL, calved in 1909	10	5	2
GUERNSEY.			
95.—Cow, in-Milk, calved before 1907	10	5	2
96.—HEIFER, in-Milk, calved in 1907	10	5	2
97.—HEIFER, calved in 1908	10	5	2
98.—HEIFER, calved in 1909	10	5	2
99.—BULL, calved in 1906 or 1907	10	5	2
100.—BULL, calved in 1908	10	5	2
101.—BULL, calved in 1909	10	5	2
KERRY.			
102.—Cow or HEIFER, in-Milk, calved in or before 1907 .	10	5	2
103.—HEIFER, calved in 1908 or 1909	10	5	2
104.—BULL, calved in 1907, 1908 or 1909 . . .	10	5	2
SPECIAL PRIZE.			
(Offered by B. de Bertodano, Esq.)			
For Best Animal in Class 102, 103 or 104, to which the Cup has not previously been awarded.			
The Bertodano Challenge Cup, value 25 Guineas. The Cup to become the property of an Exhibitor winning it three years in succession.			
DEXTER KERRY.			
105.—Cow or HEIFER, in-Milk, calved in or before 1907 .	10	5	2
106.—HEIFER, calved in 1908 or 1909	10	5	2
107.—BULL, calved in 1907, 1908 or 1909 . . .	10	5	2

CATTLE—*continued.*	First Prize.	Second Prize.	Thrd Prize
CLASS	£	£	£
The Prizes in Class 108 are offered by the English Kerry and Dexter Cattle Society.			
108.—Bull, calved in 1909, whose sire and dam are entered in the English Kerry and Dexter or Royal Dublin Society's Herd Book	**10**	**6**	**4**
SPECIAL PRIZE.			
(Offered by the English Kerry and Dexter Cattle Society.)			
The Devonshire Challenge Cup, for the Best Animal in Classes 105 to 108, bred by Exhibitor, and entered in or eligible for the English Kerry and Dexter Herd Book. The Cup to be won by the same Exhibitor with different animals three years in succession before becoming his absolute property.			
DAIRY.			
(*See Regulation* 65).			
Animals entered in the Breed Classes can, if eligible, be entered also, on payment of the additional fee, in Classes 109 *to* 112 *and* 201.			
109.—Cow, in-Milk, of any breed or cross, under 900 lbs. live weight, yielding the largest quantity of milk, of normal character, containing at each time of milking 12 per cent. of total solids, of which not less than 3 per cent. shall be fat, the period of lactation being taken into consideration . .	10	5	2
110.—Cow, in-Milk, of any breed or cross, 900 lbs. live weight or over, ditto, ditto	10	5	2
BUTTER-TEST.			
(*See Regulation* 65.)			
The Prizes in Classes 111 and 112 are offered by the English Jersey Cattle Society, and entries in them are subject to any conditions issued by that Society previous to the tests.			
111.—Cow, of any breed or cross, under 900 lbs. live weight, obtaining the greatest number of points by the practical test of the separator and churn, judged by the scale of points adopted by the English Jersey Cattle Society	**10**	**3**	**2**
112.—Cow, of any breed or cross, 900 lbs. live weight or over, ditto, ditto	**10**	**3**	**2**
Gold, Silver and Bronze Medals are offered for the three Jersey Cows, entered or eligible for entry in the			

CATTLE—*continued.*	First Prize.	Second Prize.	Thrd Prize
	£	£	£
English Jersey Herd Book, obtaining the greatest number of points in the Test, and Certificates of Merit will be granted to Jersey Cows, not being Prize Winners, entered or eligible for entry in the Herd Book, reaching the E.J.C.S. Standard of Merit.			
SPECIAL PRIZE.			
For the best quality of Butter produced by any Jersey Cow awarded a Medal, Prize, or Certificate of Merit in Classes 111 and 112	1		
The Prizes in Class 201 are offered by the English Guernsey Cattle Association.			
201.—Guernsey Cow or Heifer, entered in the English Guernsey Cattle Society's Herd Book, or eligible and tendered for entry therein, obtaining the greatest number of points by the practical Test of the Churn, the points to be reckoned on the weight of Butter and an allowance for lactation to be made under the scale settled by the English Guernsey Cattle Society	10	5	3

SHEEP.

Class SOUTH DEVON.			
113.—Shearling Ram	10	5	2
114.—Pair of Ram Lambs, dropped in 1910 . . .	10	5	2
115.—Pen of three Shearling Ewes	10	5	2
KENT OR ROMNEY MARSH.			
The Prizes in Classes 116 and 118, and the Champion Prize, are offered by the Kent or Romney Marsh Sheep Breeders' Association and the Rochester and Chatham Local Committee.			
116.—Two Shear Ram	10	5	2
117.—Shearling Ram	10	5	2
118.—Pen of Five Shearling Rams	13	7	50s.
119.—Pair of Ram Lambs, dropped in 1910 . . .	10	5	2
120.—Pen of three Shearling Ewes	10	5	2
CHAMPION PRIZE.	£ s.		
Best Ram in Classes 116 to 119 . . .	10 10		
SOUTHDOWN.			
(The Prizes in Class 121 are offered by the Southdown Sheep Society.)	£		
121.—Two Shear Ram	10	5	2
122.—Shearling Ram	10	5	2
123.—Pair of Ram Lambs, dropped in 1910 . . .	10	5	2
124.—Pen of three Shearling Ewes	10	5	2

	First Prize	Second Prize.	Thrd Prize
SHEEP—*continued.*	£	£	£
SPECIAL PRIZE.			
(Offered by the Southdown Sheep Society, under Condition 68.)			
A Champion Gold Medal, value £10 10s., or £10 10s. in cash, for the Best Ram or Ram Lamb in Classes 121, 122, or 123.			
HAMPSHIRE DOWN.			
CLASS			
125.—Shearling RAM	10	5	2
126.—Pair of RAM LAMBS, dropped in 1910 . . .	10	5	2
127.—Pen of three Shearling EWES	10	5	2
(The Prizes in Class 128 are offered by the Hampshire Down Sheep Breeders' Association.)			
128.—Pen of three Ewe Lambs, dropped in 1910 . .	**7**	**3**	
SHROPSHIRE.			
129.—Shearling RAM	10	5	2
130.—Pair of RAM LAMBS, dropped in 1910 . . .	10	5	2
131.—Pen of three Shearling EWES	10	5	2
OXFORD DOWN.			
132.—Shearling RAM	10	5	2
133.—Pair of RAM LAMBS, dropped in 1910. . .	10	5	2
134.—Pen of three Shearling EWES	10	5	2
(The Prizes in Class 135 are offered by the Oxford Down Sheep Breeders' Association, and will be withheld until the Animals awarded the prizes are registered in the Flock Book.)			
135.—Pair of Ewe Lambs, dropped in 1910 . . .	**6**	**3**	**1**
DORSET DOWN.			
(The 1st Prizes in Classes 316 to 139 are offered by the Dorset Down Sheep Breeders' Association.)			
136.—Shearling RAM	**10**	5	2
137.—Pair of RAM LAMBS, dropped in 1910 . . .	**10**	5	2
138.—Pen of three Shearling EWES	**10**	5	2
139.—Pen of three Ewe Lambs, dropped in 1910 . .	**10**	5	2
DORSET HORN.			
140.—Shearling RAM	10	5	2
141.—Pair of RAM LAMBS, dropped after November 1st, 1909	10	5	2
142.—Pen of three Shearling EWES	10	5	2
CHAMPION PRIZE.			
Offered by the Dorset Horn Sheep Breeders' Association. Best pen of Sheep in Classes 140 to 142 . .	**5**		

PIGS.

BERKSHIRE.

Class	First Prize.	Second Prize.	Thrd Prize
	£	£	£
143.—Boar, farrowed in 1907, 1908 or 1909 . .	7	3	2
144.—Pair of Boars, farrowed in 1910	5	2	1
145.—Breeding Sow, farrowed before 1910 . . .	7	3	2
146.—Pair of Breeding Sows, farrowed in 1910 . .	5	2	1
SPECIAL PRIZE.			
(Offered by the British Berkshire Society.)			
Best Boar or Sow in the Berkshire Classes entered in, or eligible for, the Herd Book, whose Sire and Dam, together with the name of its Breeder, are entered in the Catalogue	5		

LARGE BLACK.

147.—Boar, farrowed in 1907, 1908 or 1909 . . .	7	3	2
148.—Pair of Boars, farrowed in 1910	5	2	1
149.—Breeding Sow, farrowed before 1910 . . .	7	3	2
(The Prizes in Class 150 are offered by the Large Black Pig Society.)			
150.—Breeding Sow, not exceeding 12 months old on May 1st, 1910	7	3	2
151.—Pair of Breeding Sows, farrowed in 1910 . .	5	2	1
CHAMPION PRIZES.			
(Offered by the Large Black Pig Society.)	£ s.		
Best Exhibit in Classes 147 and 148 . . .	5 5		
Ditto ditto ditto 149 to 151 . . .	5 5		

LARGE WHITE.

	£		
152.—Boar, farrowed in 1907, 1908 or 1909 . . .	7	3	2
153.—Pair of Boars, farrowed in 1910	5	2	1
154.—Breeding Sow, farrowed before 1910 . . .	7	3	2
155.—Pair of Breeding Sows, farrowed in 1910 . .	5	2	1

MIDDLE WHITE.

156.—Boar, farrowed in 1907, 1908 or 1909 . . .	7	3	2
157.—Pair of Boars, farrowed in 1910	5	2	1
158.—Breeding Sow, farrowed before 1910 . . .	7	3	2
159.—Pair of Breeding Sows, farrowed in 1910 . .	5	2	1

	First Prize.	Second Prize.	Thrd Prize
	£	£	£
PIGS—*continued.*			
TAMWORTH.			
CLASS			
160.—BOAR, farrowed in 1907, 1908, or 1909 . . .	7	3	2
161.—Pair of BOARS, farrowed in 1910	5	2	1
162.—Breeding Sow, farrowed before 1910 . . .	7	3	2
163.—Pair of Breeding Sows, farrowed in 1910 . .	5	2	1

SPECIAL PRIZES.

(Offered by the National Pig Breeders' Association.)

Three Gold Medals, value £3 3s. each (or £3 3s. in money), for the best animal of each Breed exhibited in the Large White, Middle White, or Tamworth Classes, entered in or eligible for the Herd Book, and the names and numbers of whose sire and dam appear in the Catalogue.

No animal can win more than one of the Association's Gold Medals in the same year, and in the event of the winning animal being again awarded the Medal at the Royal Agricultural Society's Meeting, the animal awarded the Reserve number would succeed to the prize. No pig farrowed on or after January 1st, 1910, will be eligible to receive any Medal or Prize offered by the N.P.B.A., unless the said animal has been tattooed strictly in accordance with the regulations of the Association.

(Offered by the British Tamworth Pig Breeders' Association.)

A Challenge Bowl, value £15 15s., for the Best Exhibit in the Tamworth Classes, entered or eligible for entry in the National Pig Breeders' Associatian Herd Book. The Cup to be won two years in succession or three times altogether before becoming the property of the winner.

PRODUCE.

HOPS.

Class		First Prize.	Second Prize.
	The Prizes in Classes 164 to 166 and the Champion Prize are offered by the Rochester and Chatham Local Committee. Entries in these Classes closed on November 22nd, 1909.	£	£
164.—	Sample of East-Kent Hops	10	5
165.—	Sample of Mid-Kent Hops	10	5
166.—	Sample of Weald of Kent Hops	10	5
	CHAMPION PRIZE.		
	Best exhibit in Classes 164 to 166	20	
	WOOL.		
	(The Prizes in Class 167 are offered by the Rochester and Chatham Local Committee.)		
167.—	Three Fleeces of Kent or Romney Marsh Wool of the Clip of 1910	5	2

CIDER.

(Open to Growers or Makers.)

First Prize in each of the Classes a Gold Medal and a Certificate.

Second Prize, ditto, a Silver Medal and a Certificate.

Third Prize ditto, a Bronze Medal and a Certificate.

168.—Cask of not less than 18 and not more than 30 gallons of CIDER, made in 1909, of a specific gravity not exceeding 1·015 at 60° Fahr.

169.—12 Bottles of CIDER, made in 1909, ditto.

170.—Cask of not less than 18 and not more than 30 Gallons of CIDER, made in 1909.

171.—12 Bottles of CIDER, made in 1909.

172.—12 Bottles of CIDER, made in any year previous to 1909.

CHEESE.	First Prize.		Second Prize.		Third Prize.		Fourth Prize.	
CLASS	£	s.	£	s.	£	s.	£	s.
173.—3 Cheddar CHEESES (not less than 56 lbs.each) made in 1909	15	0	10	0	5	0	3	0
174.—3 Cheddar CHEESES (not over 56 lbs. each) made in 1909	8	0	5	0	3	0	2	0
175.—3 Single Gloucester or Wilts CHEESES made in 1910	6	0	4	0	2	0	1	0
176.—8 Loaf or other Truckle CHEESES made in 1910	5	0	3	0	2	0	1	0
177.—3 Caerphilly CHEESES, made in 1910	3	0	2	0	1	0	0	10
CREAM CHEESE, BUTTER & CREAM.								
(These Classes are not open to Professional Teachers.)								
178.—3 Cream of other Soft CHEESES	3	0	2	0	1	0	0	10
179.—3 lbs. of Fresh (or very slightly salted) BUTTER	4 4	0 0	3 3	0 0	2 2	0 0	1 1	0 0
180.—3 lbs. of Fresh (or very slightly salted) BUTTER, made from scalded cream	4	0	3	0	2	0	1	0
181.—3 lbs. of BUTTER, to which no salt whatever has been added, to be judged on the last day of Show	4	0	3	0	2	0	1	0
182.—Not less than 12 lbs. of Fresh BUTTER packed for transit	3	0	1	10				
183.—12 lbs. of Keeping BUTTER, in a jar or crock, to be delivered to the Secretary 4 weeks before the Show	4	0	3	0	2	0	1	0
184.—4 half-pounds of Scalded Cream	3	0	2	0	1	0	0	10

COMPETITIONS.	First Prize. £ s.	Second Prize. £ s.	Third Prize. £ s.	Fourth Prize. £ s.
BUTTER-MAKING.				
(*No Winner of a first prize given by this Society for Butter-making during the last* 3 *years is eligible to compete in Classes* 185 *to* 187.)				
(*For Conditions and Regulations see Entry Form.*)				
CLASS 185.—For first year students who have been through a course of instruction in Butter-making at any County Council School since the Society's last Show. On the 1st day of the Show	4 0	3 0	1 10	1 0
186.—For Men and Women, on the 2nd day of the Show	4 0	3 0	1 10	1 0
187.—For Men and Women, on the 3rd day of the Show	4 0	3 0	1 10	1 0
188.—For Men and Women, on the 4th day of the Show	4 0	3 0	1 10	1 0
CHAMPION CLASS.				
189.—For winners of first and second prizes in the Butter-making Classes 185 to 188, or at any previous meeting of the Society. On the 5th day of the Show— 1st Prize, Gold Medal. 2nd ,, Silver Medal. 3rd ,, Bronze Medal.				
MILKING.				
190.—For Men 18 years of age and over	1 10	1 0	0 15	0 10
191.—For Women 18 years of age and over	1 10	1 0	0 15	0 10
192.—For Boys and Girls under 18 years of age	1 10	1 0	0 15	0 10
SHOEING.				
193.—For NAG HORSE SHOEING, by Smiths 25 years of age and over on the day of the competition, who have not previously won the First Prize in a corresponding Class at one of the Society's meetings, or a Champion Prize at any other Society's Show, on the 2nd day of the Show	4 0	3 0	2 0	1 0

	First Prize.		Second Prize.		Third Prize.		Fourth Prize.	
	£	s.	£	s.	£	s.	£	s.
SHOEING—*continued.*								
CLASS								
194.—For CART HORSE SHOEING, by Smiths 25 years of age and over, ditto, ditto, on the 3rd day of the Show	4	0	3	0	2	0	1	0
195.—For SHOE MAKING or TURNING, by Smiths under 25 years of age on the day of the competition, the patterns and descriptions of the Shoes to be supplied by the Judge, on the 4th day of the Show . . .	4	0	3	0	1	0	0	10
196.—For SHOE MAKING or TURNING, by Smiths 25 years of age and over on the day of the competition, the patterns and descriptions of the Shoes to be supplied by the Judge, on the 4th day of the Show . .	4	0	3	0	2	0	1	0
The Prizes in Classes 197 to 200 are offered by the Kent Education Committee in duplicate, i.e., to—								
(a) **Holders of County Farriery Certificates.**								
(b) **Candidates who attend the full course of instruction at the Farriery Classes at Rochester, Spring, 1910.**								
The Competition in Classes 197, 198 and 199 is confined to Masters and Journeymen, and in Class 200 to Doormen and Apprentices.								
197.—Hacks and Harness Horses. On the 5th day of Show	2	5	1	5	0	15	0	10
198.—Hunters. On the 5th day of Show . .	2	5	1	5	0	15	0	10
199.—Agricultural Horses. On the 5th day of Show	2	5	1	5	0	15	0	10
200.—Shoe Making only. One hand fullered fore shoe for Nag Horse and one stamped Cart Horse fore shoe to be made by each Competitor, on the 5th day of Show	1	0	0	10	0	5		

CONDITIONS AND REGULATIONS FOR LIVE STOCK.

GENERAL.

Entries.

1. The following are the Fees payable for Stock entries made on or before March 24. After that date and up to March 31, entries (except in the Harness and Jumping Classes) will only be received on payment, in each case, of double the fee named below. *Exhibitors are requested to note that no exception can be made to this.* The entry fee is not returnable to an Exhibitor who enters an Animal in a Class for which it is ineligible, or for entries that are withdrawn after the date of entry has expired.

	Members. (see Reg. 5 below)	Non-Members.
Horses other than in the Harness or Jumping Classes (see Reg. 2 below) for each Entry, including Horse Box	15s. ..	30s.
Cattle, Sheep and Pigs for each Entry	10s. ..	20s.

For particulars as to fees in the Produce, Poultry, Butter-Making, Milking and Shoeing Classes, see Entry forms.

2. Animals entered in the Harness and Jumping Classes, and not having a box in the Yard, must be in the Yard by 2 p.m. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as they have been judged. Entries in the Harness and Jumping Classes, if no Horse Box is required, must reach the Secretary not later than May 5. If a Box is required the entry must reach the Secretary on or before March 24, or, at double fees, by March 31. The Entry Fees are:—

	Members.	Non-Members.
Without Horse Box, for each Entry	5s. ..	10s.
With Horse Box, do.	15s. ..	30s.

3. No Exhibitor can make more than three entries in any one Class of Horses, Cattle, Sheep or Pigs, except in the Harness or Jumping Classes.

4. No Entry will be received unless the fee accompanies it, and (if the Exhibitor is a Member of the Society) the subscription for the year, unless previously paid, together with any arrears that may be due.

5. The privilege of entering at Members' fees is strictly limited to members of the Society, elected on or before January 25, 1910, and subscribing not less than £1 annually.

6. Where a Prize is offered for a *pair* or *pen* of Animals, single entry-fees only are payable for each *pair* or *pen*, and only one entry-form must be used.

7. All Entries must be made on the printed forms to be obtained of the Secretary (Thos. F. Plowman, 3, Pierrepont Street, Bath), and, in applying for Forms, Exhibitors are requested to state how many entries they wish to make of either Horses, Cattle, Sheep, Pigs, &c., as each Stock entry must be made on a separate form.

8. Every Exhibitor or Competitor is requested to carefully examine the List of Prizes and Conditions, as he will be held responsible for the correctness of his Certificate of Entry. An Exhibitor omitting to give information asked for on the Entry Form, with regard to the age, breeder, name, colour, sire, dam, &c., of an animal will be liable to have his entry disqualified.

9. If an Exhibitor or Competitor fails, when called upon by the Stewards or Council, to prove the correctness of his Certificate of Entry to their satisfaction, the Entry may be disqualified, and any award made to it cancelled.

10. An Exhibitor who has made, in due time, an entry of Horses, Cattle, Sheep or Pigs, in a particular class, will be permitted, up to Friday, April 22, to withdraw the entry of such animal, and to substitute for it the entry of another animal in the same class, on payment of the difference, if any, between the amount of the entry fee originally paid for the animal withdrawn, and the post entry fee. When, after entry, an animal dies, the exhibitor will be permitted to substitute another entry for it, in the same class, without payment of any further fee, upon affording evidence of death and furnishing particulars of the substituted entry in time for the alteration to be made in the published catalogue.

11. An animal can be entered in as many Classes as it is eligible for on payment of an additional fee in each Class. No additional fee is, however, payable in the case of Special Prizes for exhibits already entered in any particular class.

12. Every exhibit must be the *bona fide* property of the Exhibitor both at the time of entry and on the first day of the Exhibition.

Show Yard.

13. The Yard will be open for the reception of Horses (see Regulation 2 for Harness and Jumping Horses), Cattle, Sheep and Pigs, on Saturday and Monday, May 21 and 23, from 7 A.M. to 6 P.M. Horses will also be received from 6 to 8 o'clock on the morning of the first day of Show, but all other Stock Entries must be in the Yard the previous day. A label denoting the number of each entry will be sent by the Secretary and must be securely affixed to the head of the Animal. The carriage of exhibits must in all cases be paid by the Exhibitor. No exhibit subject to charges will be received by the Officers of the Society.

14. If an animal is brought into the Show Yard without having been entered for exhibition, the owner shall be liable to a fine of £2 and to the forfeiture of any prize awarded to him or her.

15. All Live Stock (see Conditions 2, 39 and 40 for exceptions with regard to Horses) must remain in their places in the Show Yard until after 6 o'clock in the afternoon of the last day of the Show, and shall under no circumstances be taken out of their places in the interval without the special permission of the Stewards.

16. During the time the Show is open to the public no rug or cloth shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of the department.

17. All Exhibits and all persons in charge of the same, will be subject to the Orders, Regulations and Rules of the Society, and the Stewards shall have the power to remove from the Yard the Stock or property belonging to, and to cancel the admission ticket of, any Exhibitor who shall infringe any of the Regulations or Conditions of the Meeting, or who shall refuse to comply with any instructions given by the Stewards, without any responsibility attaching to the Stewards or the Society in consequence of such removal.

18. No animal shall be decorated with colours other than the Society's Prize Rosettes.

19. No person shall be allowed to fix any placard, or to take down any official placard, in the Yard, without the written permission of the Stewards.

20. All persons in charge of Exhibits will be subject to the orders of the Stewards, and will be required to parade or exhibit the animals in their charge at such times as may be directed by the Stewards. Servants must be in attendance each day during the Show at least a quarter of an hour before the time appointed for exhibiting the animals under their charge in the Show rings. Servants in charge of animals must see that the animals boxes or stalls are kept clean. No oil or cooking stove of any description must be lighted in the Horse Boxes and any one found offending in this respect will be dealt with in accordance with Regulation 33. Owners of animals exhibited will be held responsible for the behaviour of their Servants, and for the consequences of any misconduct of such Servants.

21. Servants in charge of Stock at night must, if they leave the yard, return before 10 p.m., or they will not be admitted.

22. On the day previous to the opening and on each day of the Show hay or green food and straw will be supplied by the Society free of expense to exhibitors at the Forage Stores in the Show Yard. Servants must apply at the Forage Stores for their Forage Tickets after they have brought their animals into the Yard. Corn, meal, and cake can be obtained in the Show Yard at fixed prices.

NOTE.—For the convenience of Exhibitors wishing to sell their animals, a Register will be kept at the Secretary's Office, in which they may enter the prices.

TICKETS.

23. Each Exhibitor of Live Stock will have a Free Ticket of admission to the Show Yard sent to him, except in the case of a Member of the Society, who will receive his Member's Ticket in lieu of an Exhibitor's Ticket. Tickets for the use of Servants in charge of Live Stock remaining in the Yard will also be sent, and the Exhibitor will he held responsible for the proper use of such Tickets. In the case of animals not having a box in the Yard, a Servant's Ticket will not be required as the official label will admit the Driver or Rider, Horse and Vehicle into the Yard. In case of transfer or other improper use of a Ticket the Exhibitor will be required to pay a fine of £1 for each case. Exhibitors will be held responsible for the attendance at each Parade of as many Servants as Tickets have been issued for.

RESPONSIBILITY.

24. Neither the Society nor any of its Officers or Servants shall be in any way responsible or accountable for anything that may happen (from any cause or circumstance whatever) to Exhibitors or their Servants, or to any animal or article exhibited, or property brought into the Show Yard, or otherwise for anything else in connection with, or arising out of, or attributable to, the Society's Show, or these or any other Conditions or Regulations prescribed by the Society in relation thereto.

25. Each Exhibitor shall be solely responsible for any consequential or other loss, injury, or damage done to, or occasioned by, or arising from, any animal or article exhibited by him, and shall indemnify the Society against all legal or other proceedings in regard thereto.

26. The Society, its Officers and Servants, will not be liable for any errors or mistakes that may happen in placing or penning the Stock or Articles to be exhibited, but the Servants in charge of the same must see that they are placed or penned according to their entries.

DISQUALIFICATIONS.

27. The use of resin, soap, sawdust above the knee, or other substances designed to give an artificial appearance; cording; or any other improper means adopted in showing an animal in the Agricultural Horse Classes will be regarded as a disqualification.

28. No animal which has been exhibited as Fat Stock at any Show shall be eligible to compete for the Prizes offered in this Prize Sheet.

29. An animal having any unsoundness likely to be transmitted to its progeny shall be disqualified thereby from receiving any Prize offered by or through the Society.

30. If it shall be proved to the satisfaction of the Stewards or Council that an Exhibitor or Competitor has knowingly signed an incorrect Certificate, or knowingly given an incorrect Pedigree of any animal, or has attempted to enter an animal or other exhibit or to obtain a Prize by any other unfair means at this or any other Agricultural Society's Meetings, or is under exclusion from any Breed Society for fraudulent practices, the Council shall have the power to cancel all awards made to such Exhibitor or Competitor, to disqualify him or her from exhibiting or competing at future Meetings of the Society, and to inform other Agricultural Associations of their action in this respect.

Penalties.

31. As the non-exhibition of animals entered for the Show causes unnecessary preparations and expense, and disarranges the Show Yard, any person entering Stock, and failing to exhibit the same, shall pay a penalty of 10s. for each entry, unless a Certificate, under the hand of the Exhibitor or his authorised agent, be lodged with the Secretary of the Society, before the day of exhibition, certifying that such non-exhibition is caused either by—(1) the death of the animal or animals ; or (2) contagious or infectious disease (confirmed by the explanatory certificate of a Veterinary Surgeon) ; or (3) by its becoming ineligible for the Class in which it has been entered.

32. Every Exhibitor will be required to undertake to forfeit and pay to the Society the sum of £20, as and for liquidated damages, if any animal which he exhibits be, to his knowledge, suffering from any contagious or infectious disease, and the Stewards are empowered to prevent the entry of any diseased animal into the Yard, or to have it removed therefrom.

33. Any infringement of any of these or any other prescribed Regulations or Conditions will subject the Exhibitor to a fine of £1 by the Stewards, and to the forfeiture, by order of the Council, of any prize to which he may be entitled (in addition to all other consequences attaching to such infringement). The Council reserves to itself the right to inform other Agricultural Associations of any decision it may come to with respect to an Exhibitor.

Awards.

34. The Society reserves to itself the right to withhold any prize, if, in the opinion of the Stewards, the conditions and regulations have not been properly complied with.

35. **No Second Prize offered by the Society will be given in any Class of Stock unless there are three entries, no Third Prize unless there are six entries, and no Fourth Prize unless there are nine entries.**

36. Only the signed awards of the Judges are accepted by the Society as evidence that a prize has been awarded, and the production of the prize card or the rosette by an Exhibitor will not entitle him to the prize.

37. The certificate of the Veterinary Inspector, whether as to age or soundness, shall be required only in cases where the Judges are in doubt, or where the Stewards may consider it necessary. (See also Regulation 47 with reference to Stallions and Mares.) The decision of the Inspector in such cases shall be final and conclusive ; and in case it shall be against the animal to which a Prize has been awarded, such animal shall be disqualified from receiving such Prize.

Protests.

38. Any Exhibitor wishing to lodge a protest having reference to Live Stock exhibited at this meeting must make the same in writing on a form to be obtained from the Secretary, and deposit with him the sum of £3. If on investigation the protest is not sustained to the satisfaction of the Stewards, the sum thus deposited shall, at the discretion of the Council, be forfeited to the funds of the Society. All protests (except in the Harness or Jumping Classes) must be delivered at the Secretary's Office in the Showyard, on the day on which the award is made, and no protest will be SUBSEQUENTLY received, unless a reason satisfactory to the Stewards be assigned for the delay. Any protest against an award in the Harness or Jumping Classes must be made to the Steward in the ring immediately after the judging of the class to which it refers, and a deposit of £3 must, at the same time, be handed to the Steward. The Stewards will consider such protests at 11 o'clock on the following day at the Secretary's Office, at which time and place any person making a protest must attend or be represented by his authorised agent. The decision of the Stewards shall be final.

APPLYING TO CERTAIN CLASSES ONLY.

Horses.

39. Horses can be removed from the Yard at night on deposit by the Exhibitor of £3 at the Finance Office, which sum will be forfeited if the Horse does not return at 8 A.M. each day during the Exhibition. This regulation does not apply to Animals not having a box in the Yard entered in the Harness and Jumping Classes only.

40. The Stallions in Classes 1, 2 and 19 can be taken out of the Yard after the parade of Horses on the third day of the Show.

41. Exhibitors must provide saddles for Horses in Classes 9, 10 and 15, and in Classes 35 to 44, as they are to be ridden; and vehicles and harness for those in Classes 23 to 34, which are to be driven.

42. No Horse, unless a Foal, will be admitted into the ring without a proper bit.

43. The Prizes for Stallions in Classes 1 and 19 will be withheld until a certificate from the owner is delivered to the Secretary that the Horse has served at least 10 Mares during the current season.

44. All Foals must be the offspring of the Mares with which they are exhibited, and the name of the Sire of the Foal must be stated on the certificate of entry.

45. Mares entered as in-Foal shall, except as otherwise stated, hereafter be certified to have produced a living Foal before August 1st of the year of the Show. If the required certificate, which must be on a form obtainable from the Secretary, is not received by September 30, 1910, the prize awarded will be forfeited.

46. Horses may, at the discretion of the Stewards, be measured, and the measurement shall be taken in the shoes worn by the entry at the time of judging, and these shoes shall not be removed to allow of the entry being shown in another class. In the Hackney and Harness Classes for Hackneys exceeding 14 hands (except yearling colts and fillies) no shoe (nails included) may exceed 2 lbs. in weight, and for Ponies not exceeding 14 hands, yearling oolts and yearling fillies, no shoe (nails included) may exceed $1\frac{1}{2}$ lbs. in weight,

47. All Stallions and Mares (yearlings and foals excepted) to which prizes have been awarded in the breeding classes shall be examined by the Society's Veterinary Inspector, and unless pronounced free from indications of hereditary disease shall be ineligible to receive the prize. The owner of an Animal rejected under this Regulation may, upon his application in writing to the Secretary, be furnished with a copy of the Veterinary Certificate.

48. The following special conditions apply only to the Prizes offered by the Shire Horse Society, viz.: the owner of the animal entered to have been a Member of the Bath and West and Southern Counties Society for not less than six months previous to March 31, 1910; a Mare five years old, or upwards, must produce a living Foal in the current year, or have had a living Foal in the preceding year; in the case of in-Foal Mares a certificate of foaling must be lodged with the Secretary of the Shire Horse Society before the medal will be despatched. No animal to compete which has won the Shire Horse Society's Gold Medal during the current year, the Royal and London Shows being excepted; the winning animal to be entered, or eligible for entry, in the Shire Horse Society's Stud Book; and a certificate that she is free from hereditary disease to be lodged with the Secretary of the Shire Horse Society, the Veterinary examination to be made on the ground by the Veterinary Inspector appointed for the Show. A prize of £5 will also be awarded to the breeder of the animal winning the Medal, provided that he is a member of the Shire Horse Society, and that the Dam is a Mare registered in the Shire Horse Stud Book. All awards must be completed within six months of the date upon which the Medal was awarded or they will be void.

49. The following special conditions apply only to the Prize offered by the Hunters' Improvement Society for Hunter Brood Mares, viz. :—The Mare awarded the Medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's appointed Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground.

50. The following special conditions apply only to the Prize offered by the Hunters' Improvement Society for best Mare or Gelding of any age. The Hunter awarded the medal must possess a certificate of soundness from hereditary disease, signed by the Bath and West Society's Veterinary Inspector, who must be a member of the Royal College of Veterinary Surgeons, after his examination of the animal on the Show Ground. In addition to their dams the selected Mare, if unregistered, or the selected Gelding, if unentered, must be registered or entered within a month of the award in the Hunter Stud Book. No animal may take more than one of these medals in 1910.

51. The following special conditions apply only to the Silver Medal offered by the Hackney Horse Society for Hackney Mare or Filly :—

1. No animal to be awarded a Silver Medal which has in the same year taken one of the Hackney Horse Society's £10 Prizes or Gold Medals (The Royal, London Hackney, and International (Olympia) Shows included).
2. No animal to be eligible to take more than one Silver Medal during any one year.
3. If not already registered in the Stud Book, the entry of the winner must be duly lodged with the Hackney Horse Society, and if not completed before the expiration of one month after the date of the Show the Medal shall pass to the reserve number.
4. A certificate of soundness from hereditary disease, **signed by the Local Society's appointed Veterinary Inspector after his examination on the Show Ground,** must be lodged with the Secretary of the Hackney Horse Society.

NOTE.—Horses in Saddle and Harness Classes are eligible to compete for the Silver Medal, for which they must be exhibited in hand.

52. The following special conditions apply only to the Prize of £5 or Gold Medal offered by the Hackney Horse Society in the Single Harness Classes :—All horses competing for the Prize or Medal must be *by a Registered Hackney Sire.* A certificate signed by the Breeder of the animal must be forwarded to the Secretary of the Hackney Horse Society before the Prize or Medal is despatched. Each animal must be examined by a qualified veterinary surgeon on the Show Ground, and a certificate of soundness must be supplied. The Prize or Medal must be open to all Classes, and not confined to local competition, and the name and number of the sire, and the name and address of the breeder of each animal, should appear in the catalogue. No animal can take more than one of the Harness Prizes or Medals in any one year (the Royal, London Hackney, and International (Olympia) Shows being excepted), but an animal which has been awarded one of the Society's Prizes or Medals under other schemes is eligible.

NOTE.—The winner of a Silver Harness Medal is not debarred from subsequent competition for a Gold Harness Medal in the same year.

53. The following special conditions apply only to the Medals offered by the Polo and Riding Pony Society. Height of Pony not to exceed 14.2, as confirmed by Hurlingham Certificate or that of a qualified Veterinary Surgeon. Ponies having previously won one of the Polo and Riding Pony Society's Gold or Silver Medals during the current year not to be eligible to compete. No Pony is qualified to take more than one Silver Medal during any one year. The entry of the Winner must, if not already entered in the Supplement or Registered in the Stud Book, be duly lodged with the Polo and Riding Pony Society before the Medals will be despatched. All Brood Mares to have foal-at-foot or be due to foal in 1910, or if they have foaled in 1910 and the foal has died, a veterinary certificate to the effect that the foal was born alive to be provided. All foals to be by a Thoroughbred, Arab, Registered or Entered Sire.

54. The following special conditions apply to Horses entered in the Jumping Competitions :—The jumps may consist of single hurdle, gate, double hurdle, bank, wall and water jump, at the discretion of the Judge and Stewards. Each horse competing shall have its catalogue number affixed to its breast in such a way that it may be easily seen by the general public. Each horse competing shall be ridden at the fences in the order announced by the Stewards. In case of a horse

refusing his fence it shall be allowed two further trials, and *no more.* No change of rider shall take place during the competition. The Judge may take into consideration the style in which the fences are jumped, as well as the height and breadth, and his decision shall be final.

Cattle.

55. All cattle must be properly secured to the satisfaction of the Officers of the Society, on being brought to the gate of the Yard, or they will not be admitted.

56. All Bulls must have a ring or clamp attached to the nose, and in the aged Classes must be provided with a strong chain, and be led with a proper stick.

57. All cattle will be required to be paraded in the ring at least once a day at the discretion of the Stewards.

58. No Bull calved before January 1st, 1908, or in the Aberdeen Angus Classes before December 1st, 1907, will be eligible to receive a Prize until certified to have served not less than six different Cows (or Heifers), previous to June 1st, 1910, and to be the sire of live calves dropped in the year 1910, or in the Aberdeen Angus Classes after December 1, 1909.

59. No Cow or Heifer, entered as in-milk, will be eligible to receive a Prize until certified to have had a living calf within the fifteen months preceding the date of Show, or that the Calf, if dead, was born at the proper time.

60. Every Cow or Heifer in-milk shall be milked dry in the Show Yard at 7.30 p.m. on the evening preceding the day of judging, in the presence of an officer of the Society appointed for the purpose.

61. Any animal in the Cattle Classes found to be artificially coloured will be disqualified.

62. Any person selling milk in the Yard, except in the place appointed by the Stewards, will be fined 5s. for each infringement of this Regulation.

63. The following conditions apply only to the prizes offered for Pedigree Shorthorn Dairy Cows :—The Cows and Heifers entered will be clean milked out on the evening preceding the opening of the Show to the satisfaction of the Stewards and will be again milked in the ring on the first morning of the Show in the presence of the Judge, who shall see the Milk weighed, and any animal not yielding up to the following standard will not be awarded a prize :—

	If she has calved within three calendar months of the first day of the Show.	If she has calved more than three calendar months before the first day of the Show.
Cows, 4 years and upwards, *not less than* ..	25 lbs. of Milk	20 lbs. of Milk
Cows, 3 years old and under 4 „ „ ..	20 „ „ „	15 „ „ „
Heifers, under 3 years old „ „ ..	15 „ „ „	10 „ „ „

64.—In the Kerry and Dexter Classes clipping (except in the case of a few hairs on the top of the tail) will disqualify an animal.

65. The following condition applies to animals entered in the Butter and Milk Test Classes :—The date of last calving must be given on the entry form and, when an animal calves between the date of entry and that of the Show, notice of such calving must be sent to the Secretary, or the animal may be disqualified.

66. Except in the Local and Dairy Classes, every animal entered for competition must be entered, or certified as eligible to be entered, in the Herd Book of its Breed, where such Herd Book exists and has been in existence for not less than seven years. Where an animal is entered by the Exhibitor as eligible for entry in the Herd Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

Sheep.

67. Each pen of Ewes must be of the same Flock.

68. The following conditions apply to the special prizes offered by the Southdown Sheep Society :—The sheep competing must be entered or eligible for entry in the Flock Book. In the Class for pairs of ram lambs, exhibitors will have the privilege of competing for the medal with any one of their exhibits.

69 Except in the Local Classes, every animal entered for competition must be entered or certified as eligible to be entered, in the Flock Book of its Breed, where such Flock Book exists and has been in existence for not less than seven years. Where an animal is entered by the Exhibitor as eligible for entry in the Flock Book of its breed, proof of such eligibility must be furnished to the Secretary at the time of making the entry.

Pigs.

70. The pair of Pigs in each pen must be of the same litter.

71. All Sows farrowed before 1910 shall be certified to have had a litter of live Pigs within six months preceding the first day of exhibition, or to be in-pig at the time of entering, so as to produce a litter of Pigs, farrowed at their proper time, before the 1st of September following. In the case of in-Pig Sows the Prize will be withheld until the Exhibitor shall have furnished the Secretary with a certificate of farrowing as above. If the required Certificate, which must be on a form obtainable from the Secretary, is not received on or before the 15th September following, the Prize awarded will be forfeited.

72. All Pigs exhibited with a Sow shall be her own produce, of the same litter, and not exceeding two months old at the time of the Show.

73. No Sow above 18 months old that has not produced a litter of live Pigs shall be eligible to compete in any of the Classes.

74. Any animal in the Pig Classes found to be artificially coloured or oiled will be disqualified.

75. Should any question arise as to the age of any exhibit in the Pig classes, the Stewards shall, at the request of the Judge, have the state of their Dentition examined by a competent authority. If the state of the Dentition shall indicate that the age of any of the Pigs does not agree with the Dentition Test, the Stewards shall report the same to the Council, who shall have power to disqualify such Pig or Pigs. The following is the state of Dentition in Pigs which will be considered as indicating that they exceed the ages specified below :—Six Months : Pigs having their corner permanent incisors cut will be considered as exceeding this age. Nine months : Pigs having their permanent tusks more than half up, will be considered as exceeding this age. Twelve Months : Pigs having their central permanent incisors up, and any of the three first permanent molars cut, will be considered as exceeding this age. Fifteen Months : Pigs having their lateral temporary incisors shed, and the permanents appearing, will be considered as exceeding this age. Eighteen Months : Pigs having their lateral permanent incisors fully up will be considered as exceeding this age.

Hops, Wool, Cider, Dairy Produce, Poultry, Butter-Making, Milking, and Shoeing Competitions.

For Conditions and Regulations see entry forms.

Adjudication of Prizes.

76. The Judges are instructed as follows, and entries are received subject to this :

a. Not to award any Prize or Commendation unless the entry possesses sufficient merit.

b. Not to award a Prize to any Horse or Mare, unless it is free from unsoundness likely to be transmitted to its progeny ; or if a Gelding, unless free from unsoundness ; in either case, an accident having temporary consequences only excepted.

c. In awarding Prizes to Cattle, Sheep and Pigs, to decide according to the relative merits of the animals for Breeding purposes, and not to take into consideration their present value to the butcher.

d. To make the milking capacity and form of udder one of the chief points in awarding prizes to cows and heifers in Milk.

e. To draw the attention of the Stewards to any exhibit that has been improperly prepared for exhibition, or is wrongly entered.

f. To give in a " Reserve Number " in each Class, indicating the animal or exhibit which in their opinion possesses sufficient merit for the Prize, if the animal or exhibit to which the Prize is awarded should become disqualified. Should the " Reserved Number " succeed to a prize, and be itself disqualified, the prize will be forfeited.

g. Immediately after the Judging to deliver to the Stewards their signed awards stating the numbers to which the Prizes are adjudged, and noting all disqualifications.

77. Should any question arise upon which the Judges may desire a further opinion, the Stewards shall provide them with a Referee.

Payment of Prizes.

78. Cheques for the Prizes awarded (except where further qualification of an animal is required) will be drawn at the meeting of the Finance Committee held in July, 1910, and will then be forwarded by post to the Exhibitors to whom they have been awarded.

Interpretation of Conditions.

79. The Society reserves to itself by its Council the sole and absolute right to interpret these or any other prescribed conditions and regulations, or Prize Sheets, and to arbitrarily settle and determine all matters, questions or differences in regard thereto, or otherwise arising out of or connected with or incident to the Show. Also to refuse and to cancel any entries, disqualify Exhibitors, prohibit exhibition of entries, vary or cancel awards of prizes or reserved numbers, and relax conditions, as the Society may deem expedient.

POULTRY.

(Under Poultry Club Rules).

The Birds in Classes 1 *to* 24 *and* 27 *to* 51 *must have been hatched previous to January,* 1, 1910.

Class	First Prize. £	s.	Second Prize. £	s.	Third Prize. £	s.
1.—ANY DISTINCT BREED—Cock and 4 Hens, bred in 1908 or 1909, the property of one Exhibitor, mated for breeding	**5**	**0**	**3**	**0**	**2**	**0**
2.—Cochin—Cock	1	0	0	15	0	10
3.—Ditto—Hen	1	0	0	15	0	10
4.—Brahma—Cock	1	0	0	15	0	10
5.—Ditto—Hen	1	0	0	15	0	10
6.—Plymouth Rock—Cock	1	0	0	15	0	10
7.—Ditto—Hen	1	0	0	15	0	10
8.—Orpington (Buff)—Cock	1	0	0	15	0	10
9.—Ditto—Hen	1	0	0	15	0	10
10.—Ditto (Black)—Cock	1	0	0	15	0	10
11.—Ditto—Hen	1	0	0	15	0	10
12.—Ditto (Any other colour)—Cock or Hen	1	0	0	15	0	10
13.—Minorca (Black)—Cock	1	0	0	15	0	10
14.—Ditto—Hen	1	0	0	15	0	10
15.—Minorca (White)—Cock or Hen	1	0	0	15	0	10
16.—Sussex—Cock	1	0	0	15	0	10
17.—Ditto—Hen	1	0	0	15	0	10
18.—Dorking (Coloured)—Cock	1	0	0	15	0	10
19.—Ditto—Hen	1	0	0	15	0	10
20.—Dorking (Silver Grey)—Cock	1	0	0	15	0	10
21.—Ditto—Hen	1	0	0	15	0	10
22.—Dorking (Any other variety)—Cock or Hen	1	0	0	15	0	10
23.—Faverolles—Cock	1	0	0	15	0	10
24.—Ditto—Hen	1	0	0	15	0	10
In Classes 25 and 26 the birds must have been hatched after December 31, 1909, and must not have moulted all the chicken flight feathers of the wing.						
25.—Cochin, Brahma, Plymouth Rock, Orpington, Langshan, Sussex or Dorking—Cockerel	1	0	0	15	0	10
26.—Ditto—Pullet	1	0	0	15	0	10
27.—Langshan—Cock	1	0	0	15	0	10
28.—Ditto—Hen	1	0	0	15	0	10
29.—Wyandotte—(Silver or Gold Laced)—Cock	1	0	0	15	0	10
30.—Ditto—Hen	1	0	0	15	0	10
31.—Ditto (White)—Cock	1	0	0	15	0	10
32.—Ditto—Hen	1	0	0	15	0	10
33.—Ditto—(Any other variety)—Cock	1	0	0	15	0	10
34.—Ditto—Hen	1	0	0	15	0	10
35.—Leghorn (White)—Cock	1	0	0	15	0	10
36.—Ditto—Hen	1	0	0	15	0	10
37.—Ditto—(Any other variety)—Cock	1	0	0	15	0	10
38.—Ditto—Hen	1	0	0	15	0	10

	First Prize.		Second Prize.		Third Prize.	
POULTRY—*continued.*	£	s.	£	s.	£	s.
CLASS						
39.—HAMBURG—Cock	1	0	0	15	0	10
40.—Ditto—Hen	1	0	0	15	0	10
41.—OLD ENGLISH GAME—Cock	1	0	0	15	0	10
42.—Ditto—Hen	1	0	0	15	0	10
43.—INDIAN GAME—Cock	1	0	0	15	0	10
44.—Ditto—Hen	1	0	0	15	0	10
45.—MALAY—Cock	1	0	0	15	0	10
46.—Ditto—Hen	1	0	0	15	0	10
47.—FRENCH (excluding Faverolles)—Cock	1	0	0	15	0	10
48.—Ditto—Hen	1	0	0	15	0	10
49.—ANY OTHER DISTINCT BREED (not previously mentioned)—Cock	1	0	0	15	0	10
50.—Ditto—Hen	1	0	0	15	0	10
51.—Cock and Hen, of any pure breeds, best mated to produce Table Poultry	1	0	0	15	0	10
In Classes 52 to 59 the birds must have been hatched after December 31, 1909, and must not have moulted all the chicken flight feathers of the wing.						
52.—MINORCA, ANCONA, WYANDOTTE, LEGHORN, HAMBURG, FAVEROLLES or FRENCH—Cockerel	1	0	0	15	0	10
53.—Ditto—Pullet	1	0	0	15	0	10
54.—GAME, MALAY or any other Distinct Breed not previously mentioned—Cockerel	1	0	0	15	0	10
55.—Ditto—Pullet	1	0	0	15	0	10
LIVE TABLE POULTRY.						
56.—Pair of Cockerels of any Pure Breed	1	0	0	15	0	10
57.—Ditto—Pullets ,, ,,	1	0	0	15	0	10
58.—Pair of Cross-Bred Cockerels	1	0	0	15	0	10
59.—Ditto—Pullets	1	0	0	15	0	10
SELLING CLASSES.						
60.—ANY DISTINCT BREED—Cock or Cockerel (*price not to exceed* £1 1*s*.)	1	0	0	15	0	10
61.—ANY DISTINCT BREED—Hen or Pullet (*price not to exceed* £1 1*s*)	1	0	0	15	0	10
SPECIAL PRIZES.						
(Offered by the Poultry Club, under conditions stated on Entry Form.)						
Challenge Cups value £10 10s. each.						
A.—For the best Cock or Cockerel in the Poultry Classes, the property of a Member of the Poultry Club.						
B.—Ditto—Hen or Pullet, ditto						

	First Prize.		Second Prize.		Third Prize.	
POULTRY—*continued.*	£	s.	£	s.	£	s.
SPECIAL PRIZES.						
Challenge Cups value £5 5s. each.						
C.—For the best Orpington, the property of a Member of the Poultry Club.						
D.—Ditto—Wyandotte, ditto						
E.—Ditto—Leghorn, ditto						
F.—Ditto—Plymouth Rock, ditto						
A Silver Medal for best Cock in the Poultry Classes, the Property of a Member of the Poultry Club.						
Ditto—Hen, ditto						
Ditto—Cockerel, ditto						
Ditto—Pullet, ditto						
DUCKS, GEESE & TURKEYS.						
CLASS						
62.—DRAKE or DUCK (Aylesbury)	1	0	0	15	0	10
63.— ,, ,, (Rouen)	1	0	0	15	0	10
64.— ,, ,, (Pekin)	1	0	0	15	0	10
65.—GANDER or GOOSE	1	0	0	15	0	10
66.—TURKEY—Cock or Hen	1	0	0	15	0	10
DEAD TABLE POULTRY.						
(*To be forwarded alive, and to be killed and plucked by a Poulterer acting for the Society. See Regulation* 12 *on Entry Form.*)						
In Classes 67 to 71 the birds must have been hatched after December 31, 1909, and must not have moulted all the chicken flight feathers of the wing.						
67.—Pair of Cockerels of any Pure Breed . .	1	0	0	15	0	10
68.—Ditto—Pullets ,, ,, ...	1	0	0	15	0	10
69.—Pair of Cross-Bred Cockerels	1	0	0	15	0	10
70.—Ditto—Pullets	1	0	0	15	0	10
71.—Pair of Ducklings	1	0	0	15	0	10

POULTRY.

(Under Poultry Club Rules.)

CONDITIONS AND REGULATIONS.

Charges, &c.

1. Exhibitors may make an unlimited number of Entries on payment of fees as follows :—

MEMBERS.	NON MEMBERS.
s. d.	*s. d.*
2 0	3 0

The above fees include coops, food, and attendance.

N.B.—The above fees *must* be sent with the entries, or no notice will be taken of the latter.

2. The privilege of entering at Members' fees is strictly limited to Members of the Bath and West Society, elected on or before January 25, 1910, and subscribing not less than £1 annually.

3. All entries must be made on the printed forms to be obtained of the Secretary (Thos. F. Plowman, 3, Pierrepont Street, Bath), and such forms must be correctly filled up and returned to the Secretary, together with all fees due on or before April 28. Exhibitors are requested to carefully examine the List of Prizes and Conditions, as the Society cannot be responsible for any errors made by Exhibitors in the entry forms, and birds entered in a wrong class will be necessarily excluded from competition. No alterations can be made in entry forms after they have been received by the Secretary.

4. The Council reserve the right to refuse the entries of any person.

5. Exhibitors must state the price and breed of their birds on their entry forms.

Show Yard.

6. All birds must be in the Show Yard by 6 p.m. *on Monday, May* 23, and no bird can be removed before 7 p.m. on Saturday, May 28. Any Exhibitors who send for their birds must do so between 7 and 8 p.m. on that day.

7. All carriage must be prepaid to Rochester Railway Station, otherwise the birds will not be received at the Exhibition ; but they will be conveyed free of expense from the Station to the Show Yard and back.

8. No Exhibitor or Servant will be allowed into the tent until the birds have been judged.

9. The Poultry Tent will not be open to the public until 2 o'clock on the first day of the Exhibition.

10. A non-Transferable Admission Ticket for the Exhibition will be sent to each Exhibitor whose entry fees amount to £1 and upwards.

Table Poultry.

11. In these Classes (56 to 59 and 67 to 71) quality for the table will be considered before mere weight. The date of hatching must be given, and, in the case of cross-bred birds, the breeds of the parents.

12. In Classes 67 to 71 the whole of the Birds will be first exhibited alive. They will all be killed on the evening of Tuesday, May 24, and trussed by a qualified Poulterer, the prizes being finally awarded to the dead birds. These will then all be exhibited, but will be withdrawn from exhibition when considered necessary, and, if unsold, will be returned to Exhibitors after 6 p.m. on Thursday, May 26. Exhibitors are recommended to put a reasonable price upon their exhibits in these Classes so as to promote the sale of them.

Sales.

13. All birds may be claimed at the price put upon them, any time after 4 o'clock on Tuesday, May 24, and a sale *must take place* if the price stated be paid to the Clerk in the Poultry Office at the time of claiming. *No alteration can be made in the prices stated on the entry forms* and in the Catalogue until after Thursday, May 26, when the price may be reduced on payment to the Stewards of one shilling per pen on each alteration. Birds must be *sold in pens*, and the price stated must include the basket. A charge of 10 per cent. will be made for all birds sold. The persons who have the management of the sales cannot take charge of birds which are disposed of privately.

14. No second prize will be given in any of the Classes unless there are three entries, and no third prize unless there are six entries.

DISQUALIFICATIONS.

15. The Judges are empowered to withhold a prize or prizes where birds are not considered of sufficient merit, and are instructed to disqualify any that have been clipped, drawn, trimmed, marked, or dyed. In the Game Classes birds can be shown either dubbed or undubbed.

16. An Exhibitor detected in a false statement as to the age, &c., of any bird, or in any other practice calculated to deceive or mislead the Judges or Stewards, shall forfeit all or any prizes awarded to him or her at the Show, and will be disqualified from competing at any future Show of the Society, and the Council shall have the power to inform other Societies of their action in this respect.

17. No person who shall have been shown to the satisfaction of the Council to have been excluded from exhibiting for Prizes at the exhibition of any other Society in consequence of having attempted to obtain a Prize by giving a false Certificate, or by other unfair means, and no person who is under exclusion from any Breed Society for fraudulent practices, shall be allowed to exhibit at this or any other meeting of the Society.

18. Unhealthy birds will not be exhibited, but will be immediately returned to their owners, and the fees will be forfeited.

PROTESTS.

19. In order to check frivolous and vexatious protests, no protest will be entertained unless accompanied by a deposit of £1 in each case ; and in case the protest is not substantiated the deposit may be forfeited to the funds of the Society. All protests must be made before 12 o'clock (noon) on Wednesday, May 25.

FORFEITS.

20. Persons entering birds and failing to send the same to the Exhibition will forfeit the entrance fee for each pen so left vacant.

GENERAL.

21. All birds shown must be *bona fide* the property of the Exhibitor.

22. For each pen entered the Exhibitor will receive a label, on the reverse side of which he must legibly write his name and address for the return journey.

23. All eggs laid at the Exhibition will be destroyed.

24. The Stewards pledge themselves to take every care of the birds exhibited, but neither they nor the Society will, in any case, be responsible for any accident, loss, or damage, from whatever cause arising, the exhibits being entered at the sole risk of the Exhibitors, and Exhibitors will be required to hold the Society harmless in the event of loss.

25. In case of death of any bird during the Exhibition, it will be sent back for the inspection of the Exhibitor.

26. The following are the conditions under which the Challenge Cups are offered by the Poultry Club :—

There shall be no limit as to how many times these Cups are competed for in any one year ; they may be competed for at any number of Shows on one and the same day, but in every case the winners shall receive a suitable Certificate recording the win, and the names shall be engraved on the cup or cups. A cup that has been won 8 *times by the same Exhibitor, who must be a Member of the Poultry Club, shall become his absolute property.*

27. The Poultry Department is subject to the Rules and Regulations of the Society, and its Officers.

*** *The use of properly constructed Poultry Baskets will facilitate the safe and speedy conveyance of the birds to and from the Exhibition.*

The Society cannot, under any circumstances, undertake to send telegrams to Exhibitors as to Judges' awards.

Applications for Catalogues (price 1s. *each) and printed lists of awards should be made only to the Publishers,* Messrs. WILLIAM LEWIS AND SON, *Herald Office, Bath.*

By order of the Council,

3, *Pierrepont Street, Bath.* **THOMAS F. PLOWMAN,** *Secretary.*

TELEGRAPHIC ADDRESS:—"PLOWMAN, BATH."

FINANCIAL STATEMENTS

FOR

1909

WITH ITEMS OF 1908 *FOR COMPARISON.*

The Bath and West and

SUMMARY OF THE CASH ACCOUNT

DR. WITH COMPARATIVE

Page of accompanying Cash Account.	RECEIPTS.	£ s. d.	1909. Exeter. £ s. d.	1909. Exeter. £ s. d.	1908. Dorchester. £ s. d.
	General:—				
cxliv	Dividends and Interest		642 1 6		669 0 4
cxliv	Miscellaneous		5 5 0		2 19 0
cxliv	Subscriptions from Members . . .		1,063 0 6		1,048 12 6
cxliv	Life Compositions		45 0 0		80 0 0
cxliv	Journal		48 0 3		33 14 1
				1,803 7 3	1,834 5 11
	Show:—				
cxliv	Implements		1,893 18 9		1,793 11 6
cxlvi	Horses	662 19 0			605 18 0
cxlvi	Cattle, Sheep, Goats, and Pigs	1,013 5 0			1,027 15 0
cxlvi	Catalogues, &c.	80 19 9			82 19 1
			1,757 3 9		1,716 12 1
cxlvi	Poultry		103 8 7		72 0 3
cxlviii	Shoeing		81 19 10		26 10 0
cxlviii	Shearing		54 1 4		
cxlviii	Art Manufactures		108 19 0		87 12 0
cl	Cheese and Butter		88 17 11		173 15 0
cl	Working Dairy		180 10 11		106 14 6
cl	Cider		12 18 0		8 5 0
cl	Admissions		3,739 9 0		2,388 14 3
clii	Unapportionable:—				
	Contract Premiums, &c. . .	529 10 0			488 16 0
	Sales and Fittings . . .	340 6 11			332 12 1
			869 16 11		821 8 1
clii	Subscription from Rochester and Chatham for 1910 Show		800 0 0		800 0 0
				9,691 4 0	7,995 2 8
cliv	**Experiments:—**			344 12 6	325 19 11
				11,839 3 9	10,155 8 6
	Deposit returned				1,000 0 0
	Balance in Bank, January 1st . .			330 0 3	271 4 0
				£ 12,169 4 0	11,426 12 6

Southern Counties Society.

FOR THE YEAR ENDING DEC. 31st, 1909.

STATEMENT FOR 1908. Cr.

Page of accompanying Cash Account.	PAYMENTS.	£ s. d.	1909. Exeter. £ s. d.	1909. Exeter. £ s. d.	1908. Dorchester. £ s. d.
	General:—				
cxlv	Salaries		1,125 0 0		1,125 0 0
cxlv	Printing, Postage, Stationery, &c. . .		234 16 4		230 12 6
cxlv	Journal		407 18 11		408 7 6
				1,767 15 3	1,764 0 0
	Show:—				
cxlv	Implements		595 2 8		663 11 6
cxlvii	Horses	1,073 19 3			1,099 15 0
cxlvii	Cattle, Sheep, Goats, and Pigs	2,504 19 11			2,612 15 2
cxlvii	Fodder, &c. . . .	540 4 1			625 11 0
			4,119 3 3		4,338 1 2
cxlvii	Poultry		293 10 5		275 1 7
cxlix	Shoeing		166 6 4		140 11 5
cxlix	Shearing		54 1 4		
cxlix	Art Manufactures		80 18 0		73 19 11
cxlix	Nature Study and Forestry . . .		138 6 2		127 15 9
cxlix	Music		201 0 9		212 1 8
cxlix	Horticulture		196 6 3		185 3 9
cli	Bees		10 0 0		
cli	Cheese and Butter		236 2 11		299 6 2
cli	Working Dairy		503 8 9		500 0 3
cli	Cider		92 1 3		83 13 3
cli	Public Announcements		453 6 5		393 14 9
cliii	Unapportionable:—				
	Erection of Offices, &c. .	762 1 1			870 1 3
	Carriage of Plant . .	205 9 4			100 8 3
	Stand Fittings . .	190 0 0			180 0 0
	Police	84 12 6			101 7 6
	Miscellaneous . . .	280 16 8			278 19 10
			1,522 19 7		1,530 16 10
				8,662 14 1	8,823 18 0
clv	**Experiments:—**			446 14 9	508 14 3
				10,877 4 1	11,096 12 3
	Balance in Bank, Dec. 31st.			1,291 19 11	330 0 3
			£	12,169 4 0	11,426 12 6

January 17th, 1910.
Audited and found correct,
F. CLIFFORD GOODMAN, F.C.A.,
Auditor.

Passed by Council,
February 2nd, 1910.
THOS. F. PLOWMAN,
Secretary.

The Bath and West and

DR. CASH ACCOUNT FOR THE YEAR ENDING DEC. 31ST,

RECEIPTS.	1909. Exeter. £ s. d.	£ s. d.	1908. Dorchester. £ s. d.
DIVIDENDS AND INTEREST :—			
Consols	138 2 6		138 14 8
New Zealand Stock	51 18 1		52 2 8
India Stock	213 18 2		214 17 0
Canada Stock	67 14 11		68 0 10
Queensland Stock	104 1 10		104 11 0
New South Wales Stock	66 6 0		66 11 10
Interest on Deposit			24 2 4
		642 1 6	669 0 4
MISCELLANEOUS :—			
Cancelled Cheques	5 0 0		2 0 0
Sales etc.	0 5 0		0 19 0
		5 5 0	2 19 0
SUBSCRIPTIONS FROM MEMBERS :—			
Arrears	28 2 0		20 2 0
Governors	176 6 0		185 9 0
Subscribers of £1 and upwards	848 2 0		831 11 0
Ditto of 10s.	10 10 6		11 10 6
		1,063 0 6	1,048 12 6
LIFE COMPOSITIONS		45 0 0	80 0 0
JOURNAL :—			
Sales	16 18 10		8 8 3
Advertisements	31 1 5		25 5 10
		48 0 3	33 14 1
IMPLEMENTS :—			
Fees for Space :—			
Machinery-in-Motion Shedding	418 15 0		406 15 0
Ordinary ,,	329 10 0		353 10 0
Miscellaneous ,,	174 7 6		214 7 6
Boarded ,,	388 3 6		352 10 0
Seed ,,	56 15 0		32 10 0
Uncovered Ground	352 4 3		254 12 0
Catalogue Fees	89 13 6		103 7 0
Entry Fees	84 10 0		76 0 0
		1,893 18 9	1,793 11 6
Carried forward		£ 3,697 6 0	

Southern Counties Society.

1909, WITH COMPARATIVE STATEMENT FOR 1908. Cr.

PAYMENTS.	1909. Exeter. £ s. d.	£ s. d.	1908. Dorchester. £ s. d.
SALARIES :—			
Secretary (including Clerks, Show Expenses, &c.)	1,050 0 0		1,050 0 0
Auditor	20 0 0		20 0 0
Consulting Chemist	30 0 0		30 0 0
,, Botanist	25 0 0		25 0 0
		1,125 0 0	1,125 0 0
MISCELLANEOUS :—			
Printing	23 1 3		29 16 2
Stationery and Finance Books	40 9 1		36 0 9
Postages, Telegrams, Cheque and Receipt Stamps	59 1 11		56 2 8
Ground Rent and Rates	19 14 7		18 9 10
Income and Property Tax	1 17 6		1 17 6
Travelling Expenses	28 4 9		26 5 0
Carriage of Goods	11 17 0		11 3 1
Directories and Reference Books	1 0 10		2 0 8
Subscriptions	5 5 0		5 5 0
Repairs and Fittings	17 5 0		8 11 7
Hire of London Rooms for Meetings	6 6 0		6 6 0
Fuel and Lights	6 10 5		8 4 7
Finance Committee's Expenses	9 3 0		10 9 8
Tuberculosis Committee			10 0 0
		234 16 4	230 12 6
JOURNAL :—			
Editor	100 0 0		100 0 0
Associate Editor	100 0 0		100 0 0
Printing and Binding	146 0 6		134 3 3
Plans and Blocks	7 1 8		4 11 6
Journal Distribution	18 18 11		19 10 3
Postage, Stationery, Reference Books, &c.	4 7 10		3 11 6
Payments to Authors	31 10 0		46 11 0
		407 18 11	408 7 6
IMPLEMENTS :—			
Shedding	499 9 8		561 14 2
Stewards and Assistants	55 15 9		58 16 1
Printing, Stationery, &c.	33 7 3		42 5 3
Fees returned	6 10 0		0 16 0
		595 2 8	663 11 6
Carried forward	£	2,362 17 11	

DR. CASH ACCOUNT—*continued.*

RECEIPTS.				1909. Exeter.		1908. Dorchester.
	£	s.	d.	£ s. d.	£ s. d.	£ s. d.
Brought forward .					3,697 6 0	
HORSES, CATTLE, SHEEP, GOATS AND PIGS :						
Horses :—Entry Fees . .	211	5	0			190 0 0
Fines and Forfeits	5	10	0			5 0 0
Grand Stand Admissions	421	4	0			346 18 0
Special Prizes .	25	0	0			64 0 0
				662 19 0		605 18 0
Cattle, Sheep, Goats, and Pigs :—						
Entry Fees . .	562	15	0			632 15 0
Fines . . .	22	0	0			31 0 0
Special Prizes .	428	10	0			364 0 0
				1,013 5 0		1,027 15 0
Catalogues, &c.				80 19 9		82 19 1
					1,757 3 9	1,716 12 1
POULTRY :—						
Entry Fees				101 10 0		71 18 0
Commission on Sales				1 18 7		0 2 3
					103 8 7	72 0 3
Carried forward .				£	5,557 18 4	

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	£ s. d.	£ s. d.	1909. Exeter. £ s. d.	1909. Exeter. £ s. d.	1908. Dorchester. £ s. d.
Brought forward .				2,362 17 11	
HORSES, CATTLE, SHEEP, GOATS AND PIGS:					
Horses—Prizes		701 0 0			713 0 0
Shedding & Grand Stand		281 12 6			282 7 7
Stewards and Assistants		54 3 5			66 10 2
Judges . . .		37 3 4			37 17 3
			1,073 19 3		1,090 15 0
Cattle—Prizes . . .		1,140 10 0			1,124 0 0
Sheep—Prizes . . .		544 0 0			578 0 0
Goats—British Goat Society		6 0 0			
Pigs—Prizes .	196 0 0				207 0 0
Less Deferred	17 0 0				2 0 0
		179 0 0			205 0 0
Shedding and Canvas		439 4 4			517 9 3
Stewards and Assistants		39 15 4			37 10 8
Judges . . .		155 0 3			150 5 3
Fees Returned, etc.		1 10 0			0 10 0
			2,504 19 11		2,612 15 2
Buildings, etc.		236 0 6			256 0 6
Fodder and Insurance .		171 18 7			229 5 2
Fodder Assistants . .		7 2 8			7 0 4
Veterinary Inspector .		26 18 6			26 11 0
Rosettes		10 19 4			11 3 4
Printing and Stationery .		76 8 5			74 15 5
Refreshments for Judges .		10 16 1			10 15 3
Deferred Prize of 1907 .					10 0 0
			540 4 1		625 11 0
				4,119 3 3	4,338 1 2
POULTRY:—					
Marquee, Staging and Shed . . .			83 5 10		69 7 6
Steward and Assistants			26 4 4		24 17 8
Judges			11 10 0		15 1 0
Prizes			155 16 0		152 15 0
Printing, Stationery, Cartage, &c. . .			16 14 3		13 0 5
				293 10 5	275 1 7
Carried forward .			£	6,775 11 7	

DR. CASH ACCOUNT—*continued.*

RECEIPTS.	1909. Exeter.		1908. Dorchester.
	£ s. d.	£ s. d.	£ s. d.
Brought forward .		5,557 18 4	
SHOEING :—			
Entry Fees	45 5 0		26 10 0
Grant for Local Prizes and Expenses . .	36 14 10		
		81 19 10	26 10 0
SHEARING :—			
Entry Fees	5 15 0		
Grant for Local Prizes and Expenses . .	48 6 4		
		54 1 4	
ART-MANUFACTURES :—			
Fees for Space		108 19 0	87 12 0
Carried forward .	£	5,802 18 6	

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	1909. Exeter. £ s. d.	£ s. d.	1908. Dorchester. £ s. d.
Brought forward		6,775 11 7	
SHOEING :—			
Prizes	55 0 0		38 10 0
Judges	15 18 10		11 19 8
Anvils, Forges, Coals, Horses, Printing, etc.	16 4 5		15 7 4
Shedding	43 6 3		50 11 9
Steward and Assistants	12 16 3		11 10 4
Fees returned	23 0 7		12 12 4
		166 6 4	140 11 5
SHEARING :—			
Prizes and Fees returned	21 17 6		
Judges	2 8 9		
Shedding	20 15 2		
Stewards and Assistants, Printing, &c.	5 7 11		
Hurdles	3 12 0		
		54 1 4	
ART-MANUFACTURES :—			
Labour and Fittings	72 7 6		67 9 6
Steward and Assistants, Judge, Printing, etc.	8 11 0		6 10 5
		80 18 0	73 19 11
NATURE STUDY AND FORESTRY :—			
Labour and Fittings	85 8 3		84 9 6
Steward and Assistants	14 11 9		10 5 2
Printing, Postage, etc.	20 6 6		21 1 5
Prizes	8 4 8		8 4 8
Judges	4 15 0		3 15 0
Pruning Demonstrator	5 0 0		
		138 6 2	127 15 9
MUSIC :—			
Bands and their Fares	165 0 0		176 0 0
Steward and Assistants	4 0 9		4 1 8
Erecting Band Stand and Seats, etc.	32 0 0		32 0 0
		201 0 9	212 1 8
HORTICULTURE :—			
Gratuities to Gardeners	100 0 0		91 10 0
Erecting and Repairing Tent and Staging	78 13 0		75 0 0
Steward and Assistants	17 13 3		18 13 9
		196 6 3	185 3 9
Carried forward	£	7,612 10 5	

Dr. CASH ACCOUNT—*continued.*

RECEIPTS.		1909. Exeter.		1908. Dorchester
		£ s. d.	£ s. d.	£ s. d.
Brought forward			5,802 18 6	
CHEESE AND BUTTER :—				
Entry Fees		69 5 0		91 7
Sales		16 7 11		23 2
Special Prizes, &c.		3 5 0		59 5
			88 17 11	173 15
WORKING DAIRY :—				
Admissions		3 10 9		2 18
	£ s. d.			
Entry Fees, Competitions	38 17 6			24 15
„ Dairy Appliances	4 4 0			11 0
„ Butter and Milk Tests	35 10 0			33 0
		78 11 6		68 16
Sale Premium		35 0 0		25 0
Grant for Prizes and Expenses		61 3 8		10 0
Carriage returned		2 5 0		
			180 10 11	106 14
CIDER :—				
Entry Fees			12 18 0	8 5
ADMISSIONS TO SHOW-YARD :—				
Admissions at 2*s.* 6*d.*		1,641 0 0		1,221 15
„ „ 1*s.*		1,928 9 0		1,028 17
„ „ 6*d.*		124 5 0		49 16
Season Tickets, etc.		45 15 0		88 6 3
			3,739 9 0	2,388 14 3
Carried forward		£	9,824 14 4	

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	1909. Exeter. £ s. d.	£ s. d.	1908. Dorchester. £ s. d.
Brought forward .		7,612 10 5	
BEES :—			
Devon Beekeepers' Association . . .		10 0 0	
CHEESE AND BUTTER :—			
Judges	10 17 0		10 9 4
Prizes	146 0 0		197 0 0
Steward and Assistants	13 5 4		14 16 7
Shedding	53 11 0		64 17 6
Printing, Stationery, Carriage, &c. . .	7 9 7		7 2 9
Grass Table for Butter	5 0 0		5 0 0
		236 2 11	299 6 2
WORKING DAIRY :—			
Stewards and Assistants	55 8 8		55 13 3
Judges and Demonstrators	61 8 11		63 12 11
Buildings	237 6 10		242 9 4
Printing, Stationery, Postage and Insurance	10 15 4		9 10 10
Utensils, Carriage, Milk and Churners for Tests, &c.	40 14 2		36 5 4
Prizes	68 2 4		60 18 8
Coal, Salt, Ice, &c.	6 15 0		6 15 10
Consulting Chemist for Analyses . . .	12 17 6		16 8 2
Returned on Milk Contract . . .	10 0 0		
Purchase of Plant			8 5 11
		503 8 9	500 0 3
CIDER :—			
Shedding and Fittings	29 0 0		28 0 0
Steward and Assistants	20 0 11		18 13 2
Judge	5 9 4		5 18 8
Prizes	13 9 0		13 18 8
Printing, &c.	6 8 0		4 10 9
Analyses, Carriage, &c.	17 14 0		12 12 0
		92 1 3	83 13 3
PUBLIC ANNOUNCEMENTS :—			
Advertising	193 15 9		196 9 3
Billposting.	134 9 0		95 1 3
Railway Placards	58 13 4		40 0 0
Printing	66 8 4		62 4 3
		453 6 5	393 14 9
Carried forward .	£	8,907 9 9	

DR. CASH ACCOUNT—*continued.*

RECEIPTS.	1909 Exeter. £ s. d.	£ s. d.	1908 Dorchest[er] £ s.
Brought forward .		9,824 14 4	
SHOW (UNAPPORTIONABLE):—			
Sales and Fittings	340 6 11		332 12
Contract Premiums, &c.	529 10 0		488 16
		869 16 11	821 8
SUBSCRIPTIONS FROM TOWNS:—			
Rochester and Chatham, for 1910 Show .		800 0 0	800 0
Carried forward .		£ 11,491 11 3	

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	1909. Exeter. £ s. d.	£ s. d.	1908. Dorchester. £ s. d.
Brought forward .		8,907 9 9	
SHOW (UNAPPORTIONABLE) :—			
Official Buildings, &c.	606 6 1		642 5 3
Hoarding	155 15 0		227 16 0
Carriage of Plant	205 9 4		100 8 3
Works Assistant	7 10 8		7 14 8
Stand Fittings	190 0 0		180 0 0
Insurance	13 12 9		13 7 3
Furnishing Pavilions	22 8 6		22 17 6
Mess Room, Allotment Expenses, &c.	13 8 3		15 3 1
Gatekeepers, Yardmen, Messengers, &c.	92 13 10		86 16 6
Stewards of Finance and Treasurer	27 17 2		31 12 2
Finance Office and Treasurer's Clerks	33 4 2		30 1 10
Police	84 12 6		101 7 6
Badges, &c.	4 13 2		4 6 3
Catalogues for Press and Officials	8 14 10		11 10 11
Purchase of Plant	7 12 0		13 0 0
Printing and Stationery	42 1 4		31 19 8
Extension of Telegraph Wires	4 0 0		10 10 0
Ambulance	3 0 0		
		1,522 19 7	1,530 16 10
Carried forward .	£	10,430 9 4	

Dr. CASH ACCOUNT—*continued.*

RECEIPTS.	1909. Exeter. £ s. d.	£ s. d.	1908. Dorchest £ s.
Brought forward .		11,494 11 3	
EXPERIMENTS :—			
Manures and Mutton :—			
Sale of Sheep	245 6 0		279 17
,, ,, Wool	33 6 6		21 2
,, ,, Water Cart and Troughs . .	16 0 0		
Government Grant	50 0 0		25 0
		344 12 6	325 19
		11,839 3 9	10,155 8
Bank deposit returned . . .			1,000 0
Balance in Bank, Jan. 1st . .		330 0 3	271 4
	£	12,169 4 0	11,426 12

CASH ACCOUNT—*continued*. Cr.

PAYMENTS.	£ s. d.	1909. Exeter. £ s. d.	1909. Exeter. £ s. d.	1908. Dorchester. £ s. d.
Brought forward .			10,430 9 4	
EXPERIMENTS :—				
Field :—				10 5 6
Manures and Mutton—				
Capital Account :				
Fencing and Appliances .	13 8 6			19 9 7
Current Account :				
Rent of Fields, Cake, Manures, and Carriage	34 18 10			40 17 6
Sheep and Expenses of Ditto	248 14 11			292 11 10
Steward and Postage . .	22 11 6			21 12 4
Shepherding, &c. . . .	15 1 0			12 17 6
Printing Report . .	12 0 0			11 0 0
		346 14 9		398 8 9
Cider Institute		100 0 0		100 0 0
			446 14 9	508 14 3
			10,877 4 1	11,096 12 3
Balance in Bank, Dec. 31st .			1,291 19 11	330 0 3
		£	12,169 4 0	11,426 12 6

Jan. 17*th*, 1909.

I hereby certify that I have examined the foregoing accounts for the year ending December 31st, 1909, compared the payments entered with the vouchers, and found them all in order and correct.

F. CLIFFORD GOODMAN, F.C.A.,
Auditor.

Passed by Council,
Feb. 2*nd*, 1910.

THOS. F. PLOWMAN,
Secretary.

EXETER MEETING, 1909.

ASSETS AND LIABILITIES ACCOUNT TO DECEMBER 31st, 1909, WITH COMPARISON FOR 1908.

ASSETS.

	Actual Cost £ s. d.	Market Value on Dec. 31. £ s d.	1909. Exeter. £ s. d.	1908 Dorchester. £ s. d.
INVESTMENTS			19,195 6 4	19,531 14 7
New Zealand Stock	1,500 0 0	1.528 17 5		
Consols ,, .	5,809 19 6	4,841 9 5		
India ,, .	7,277 5 1	6.370 4 9		
Canada ,, .	2,000 0 0	1,790 13 4		
Queensland ,, .	3,000 0 0	2,806 9 7		
N. S. Wales ,, .	2,000 0 0	1,857 11 10		
	21,587 4 7	19,195 6 4		
PLANT :—				
Works		308 4 8		334 17 8
Dairy		13 17 0		15 8 0
			322 1 8	350 5 8
HOUSE PROPERTY . . .		633 10 7		633 10 7
FURNITURE AND FITTINGS .		188 15 5		189 15 2
			822 6 0	823 5 9
SUBSCRIPTION ARREARS . . .			75 12 0	70 0 0
			20,415 6 0	20,775 6 0
BALANCE IN BANK . .			1,291 19 11	330 0 3
		£	21,707 5 11	21,105 6 3

LIABILITIES.

	1909. Exeter. £ s. d.	1908. Dorchester. £ s. d.
DEFERRED PRIZES	17 0 0	10 0 0
ROCHESTER AND CHATHAM MEETING .	800 0 0	800 0 0
JOURNAL, cost of, estimated at . . .	450 0 0	450 0 0
	1,267 0 0	1,260 0 0
BALANCE	20,440 5 11	19,845 6 3
£	21,707 5 11	21,105 6 3

January 17th, 1910.
Audited and found correct,
F. CLIFFORD GOODMAN, F.C.A., Auditor.

Passed by Council,
February 2nd, 1910.
THOS. F. PLOWMAN, Secretary.

Bath and West and Southern Counties Society.

STATEMENT SHOWING FINANCIAL RESULT OF THE EXETER (1909) SHOW.

Printed Financial State-ments.		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Page													
cxlii	Show Receipts							9,691	4	0			
cxliii	,, Payments . . .				8,662	14	1						
cxvi	Deferred Prizes . . .				17	0	0						
					8,679	14	1						
cliii	Less Show Plant purchased	7	12	0									
	,, 10 per cent. for depreciation	0	15	0									
					6	17	0						
								8,672	17	1			
	Net gain . .										£1,018	6	11

Bath and West and Southern Counties Society,

FOR THE

Encouragement of Agriculture, Arts, Manufactures and Commerce.

List of Members, 1910.

Names thus (*) distinguished are Governors.
Names thus (†) distinguished are Life Members.
*** *Members are particularly requested to make the Secretary acquainted with any errors in the names of residences.*

Name.	Residence.	Sub-scriptions. £	s.	d.
†*His Most Gracious Majesty the King . . .	Windsor Castle	..		
†H.R.H. The Prince of Wales, K.G. . . .	Sandringham	..		
†Ackers, B. St. John . .	Huntley Manor, Huntley, near Gloucester	..		
Ackland, J. . . .	Cutton Farm, Poltimore, Exeter .	1	0	0
Acland, Alfred Dyke . .	3, Cadogan Square, London, S.W. .	1	0	0
†Acland, Rt. Hon. A. H. Dyke	29, St. James Court, Buckingham Gate, London, S.W. . .	..		
*Acland, Sir C. T. D., Bart.	Killerton, Exeter	5	0	0
Acland, F. Dyke, M.P. .	Colby Hall, Askrigg, Yorks . .	1	0	0
Acland, J. Dyke. . .	Bossington, Allerford, Taunton .	1	0	0
Adams, George . . .	Wadley House, Faringdon, Berks	1	0	0
Adams, R. and H. (Ld.) .	10, Queen Square, Bristol . .	1	0	0
*Addington, Hon. G. . .	Upottery Manor, Honiton . .	2	0	0
Adeane, C. R. W. . .	Babraham, Cambridge . . .	1	0	0
†Aitken, G. H. . . .	Longleat Estate Office, Warminster	..		

Name.	Residence.	£	s.	d.
Akers, E.	St. Fagans, Cardiff	1	0	0
Alexander, D.	5, High Street, Cardiff	1	1	0
Alexander, H. G.	Dinas Powis, Cardiff	1	1	0
Allen, A.	Stoney Stratton, Evercreech, Bath	1	0	0
†Allen, Major-Gen. R. E., C.B.	10, Hanover Square, London, W.		..	
†Allen, James D.	Springfield House, Shepton Mallet		..	
*Allen, J.	Park Place, Cardiff	2	0	0
Allen, W. T.	West Bradley, Glastonbury	1	0	0
Allin, Mrs. N.	Townsend Manor Farm, Over Wallop, Stockbridge	1	0	0
Allix, C. I. L.	St. Germans, Cornwall	1	0	0
Ames, F.	Hawford Lodge, Worcester	1	0	0
*†Amherst, Earl	Montreal, Sevenoaks		..	
Andrews, S. Fox	Union Street, Bath	1	0	0
Anglo-Bavarian Brewery Company	Shepton Mallet	1	0	0
Anglo-Continental Guano Works	15, Leadenhall Street, London, E.C.	1	0	0
Anglo-Swiss Condensed Milk Company	Chippenham	1	0	0
Ashburton, Lord	The Grange, Alresford, Hants	1	0	0
†Ashcombe, Lord	Denbies, Dorking		..	
Ashcroft, W.	13, The Waldrons, Croydon	1	0	0
Ashford, E. C., M.D.	The Moorlands, Bath	1	0	0
*Astor, Waldorf	Clivedon, Taplow, Bucks	2	0	0
Augustein, J. R.	Holbrook House, Wincanton	1	0	0
†Avebury, Lord	High Elms, Hayes, Kent		..	
†Aveling, Thomas L.	Rochester		..	
Avon Manure Company (Ld.)	St. Philip's Marsh, Bristol	1	0	0
Awdry, C.	Shaw Hill, Melksham	1	0	0
Awdry, P. D.	Chippenham	1	0	0
Badcock, H. Jefferies	Taunton	1	0	0
Bailey, J.	Nynehead, Wellington, Somerset	1	0	0
Bailward, F. H. M.	Horsington, Wincanton	1	1	0
Bainbridge, Mrs. R. C.	Elfordleigh, Plympton, South Devon	1	0	0
Baker, G. E. Lloyd	Hardwicke Court, nr. Gloucester	1	0	0
†Baker, M. G. Lloyd	The Cottage, Hardwicke, Glos.		..	
†Baker, L. J.	Ottershaw Park, Chertsey, Surrey		..	
†Baker, Robert W. G.	2, Leighfield Terrace, Seaton, Devon		..	
Baker, G.	The Green, Raglan. Mon.	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Baker, S.	Lower Grange, Magor, Mon.	1	1	0
*Balston. W. E.	Barvin, Potters Bar, Herts	2	0	0
Bamford, H. and Sons	Uttoxeter	1	0	0
*Bannatyne, J. F.	Haldon, Exeter	2	2	0
Barford and Perkins	Peterborough	1	0	0
Barham, G. T.	Sudbury Park, Wembley, Middlesex	1	0	0
Baring, Hon. A. H.	The Grange, Alresford, Hants	1	0	0
Barker, Sir J., Bart., M.P.	The Grange, Bishops Stortford	1	0	0
Barlow, Sir J. Emmott, Bart., M.P.	Torkington Lodge, Hazel Grove, near Stockport	1	0	0
Barrett, Major William	Moredon, North Curry, Taunton	1	0	0
Barrett, Col. W.	Moredon, Taunton	1	0	0
Barstow, J. J. J.	The Lodge, Weston-super-Mare	1	1	0
Barton, D. J.	Castle Farm, South Cadbury, Somerset	0	10	0
Bassett, A. F.	Tehidy, Camborne, Cornwall	1	0	0
*†Bath, Marquess of	Longleat, Warminster		..	
Bath and Wells, The Bishop of	The Palace, Wells	1	1	0
Bath Gas Company	Bath	1	0	0
†Bathurst, C., M.P.	Lydney Park, Glos.		..	
Batten, Col. Cary	Abbotsleigh, Bristol	1	0	0
Batten-Pooll, R. H.	Road Manor, Bath	1	0	0
†Battishill, W. J.	Spreyton, Exeter		..	
†Baxendale, J. Noel	Allington, Eastleigh		..	
Bayley, J.	Highlands, Ivybridge, S. Devon	1	0	0
Beauchamp, E. B.	Trevince, Redruth	1	0	0
Beauchamp, F. B.	Woodborough House, Peasedown St. John, Bath	1	1	0
*Beaufort, Duke of	Badminton, Chippenham	2	2	0
Beaufoy, M. H.	Coombe Priory, Shaftesbury	1	0	0
Bennett, Brothers	*Journal* Office, Salisbury	1	1	0
Bennetts, J. M.	Killaganoon, St. Feocks, Cornwall	1	1	0
Bentall, Edward H. & Co.	Heybridge, Maldon, Essex	1	0	0
Benyon, H. A.	Englefield House, Reading	1	1	0
*Benyon, J. Herbert	Englefield House, Reading	5	0	0
Berryman, F. H.	Field House, Shepton Mallet	1	1	0
Best, Capt. T. G.	Redrice, Andover	1	0	0
†Best, Capt. W.	Vivod, Llangollen, North Wales		..	
Bigg, Thomas	Liecester House, Great Dover Street, London, E.C.	0	10	0
Birmingham, C.	Holnicote, near Minehead	1	1	0
†Blackburn, H. P.	Donhead Hall, Salisbury		..	
Blackstone & Co. (Ltd.)	Rutland Iron Works, Stamford	1	1	0
Blagrove, Col. H., C.B.	Westholme, Pilton, Somerset	1	1	0
Blake, M. Lock	Bridge, S. Petherton	1	0	0
Blathwayt, R. T.	Dyrham Park, Chippenham	1	1	0

Name.	Residence.	Subscriptions. £ s. d.
Board, R. J.	Skinner, Board & Co., Rupert St., Bristol	1 0 0
Boby, Robert	Bury St. Edmunds, Suffolk	1 0 0
Bolden, Rev. C.	Preston Bissett, Buckingham	1 0 0
Bolitho, R. F.	Ponsandane, Penzance	1 1 0
Bolitho, T. B.	Trewidden, Penzance	1 0 0
Bolitho, T. R.	Trengwainton, Heamoor, Cornwall	1 1 0
Bond, E.	Hele, Cullompton	1 0 0
†Bond, N.	Creech Grange, Wareham, Dorset	..
Boscawen, Rev. A. T.	Ludgvan Rectory, Long Rock, R.S.O., Cornwall	1 0 0
Boscawen, Hon. John R. de C.	Tregye, Perranwell, Cornwall	1 1 0
Boscawen, Townshend E.	2, Old Burlington St., London, W.	1 0 0
†Boughton-Knight, A. R.	Downton Castle, Ludlow	..
Bouverie, Hon. Mrs. Pleydell	Coleshill House, Highworth	1 1 0
Bouverie, H. P.	Brymore, Bridgwater	1 0 0
†Bowen-Jones, J.	Beckbury, Shrewsbury	..
†Bowerman, Alfred	Capton, Williton, Somerset	..
†Bowring, R.	Polsham House, Wells	..
Boyle, M.	The Manor, Steeple Fitzpaine, Taunton	1 0 0
Braby, E. E.	Drungewick Manor, Horsham, Sussex	1 0 0
Braby, F. & Co.	Ashton Gate Works, Bristol	1 0 0
Bradford Thomas & Co.	Salford, Manchester	1 0 0
Brand, Admiral Hon. T. S.	Glynde, Lewes, Sussex	1 0 0
†Brassey, A.	Heythrop, Chipping Norton	..
*†Brassey, H. L. C.	Apethorpe Hall, Wansford, Northants	..
Bridges, J. H.	Ewell Court, near Epsom	1 1 0
Bristol Times and Mirror, Proprietors of	Bristol	1 0 0
Bristol Wagon Works Co. (Ltd.)	Lawrence Hill, Bristol	1 1 0
Britten, Admiral R. F.	Kenswick, Worcester	1 0 0
†Broadmead, W. B.	Enmore Park, Bridgwater	..
†Brocklehurst, H.D.	Sudeley Castle, Winchcombe	..
Brockman, F. D.	Beach Borough, Hythe, Kent	1 0 0
Broderip, E.	Cossington, Somerset	1 0 0
Browning, Albert, M.A.	The Homestead, Combe Park, Bath	1 1 0
Bruford, R.	Nerrols, Taunton	1 0 0
†Buckingham, Rev. F. F.	The Rectory, Doddiscombsleigh, Dunsford, Devon	..
Buckingham, W.	Millbrook Farm, North Molton	1 0 0
Budd, Felix S.	Clarendon House, Stow Park, Newport, Mon.	1 0 0

Name.	Residence.	Subscriptions. £	s.	d.
Budd, J. E.	Tidebrook Manor, Wadhurst, Sussex	1	0	0
Burghclere, Lord	Titsey Place, Surrey	1	0	0
Burnard, R.	Cattedown, Plymouth	1	0	0
Burrell, C., and Sons	St. Nicholas Works, Thetford	1	0	0
†Burrell, Sir C. R., Bart.	Knepp Castle, Sussex	..		
Burton, J. H., M.Sc.	County Education Office, Weston-super-Mare	1	1	0
Bush, Mrs. L. E.	St. Mary's, Atlantic Road South, Weston-s-Mare	1	1	0
Buswell, C. and W.	Torquay	1	0	0
*Bute, The Marquess of	The Castle, Cardiff	2	0	0
Butland, Bros.	Leigham, Plympton	1	0	0
Butters, G.	Hill House, Newton, Leominster	1	0	0
Butterworth, R. W.	21, St. James's Square, Bath	1	0	0
Byng, Col. Hon. C.	Edymead House, Launceston	1	0	0
Cadogan, Earl, K.G.	Culford, Bury St. Edmunds	1	1	0
Cæsar, H. and J.	Knutsford, Cheshire	1	0	0
Came, J. and G.	Woodhuish, Brixham	1	0	0
Candy, T. C.	Woolcombe, Cattistock, Dorset	1	0	0
Carew, C.	Collipriest, Tiverton	1	0	0
†Carey, Alderman P. W.	Shanbally, Cardiff	..		
Carnarvon, Earl of	Highclere Castle, Newbury	1	1	0
Carr, Richardson	Estate Office, Tring Park, Herts	1	0	0
*Carrington, Earl, K.G.	53, Princes Gate, London, S.W.	2	0	0
†Carruthers W., F.R.S.	14, Vermont Road, Norwood, London, S.E.	..		
†Carter, E.	East Upton, Ryde, Isle of Wight	..		
Carter, J. & Co.	238, High Holborn, London	1	0	0
†Cartwright, F. F.		..		
Cartwright, T. G.	30, Beaufort Gardens, London, S.W.	1	0	0
Carver, H. R.	West House, Chilton Polden, Bridgwater	1	0	0
Cary, Edmund	Pylle, Shepton Mallet	0	10	0
†Cary, W. H.	Steeple Ashton Manor, Trowbridge	..		
†Cary, John	The Priory, Shepton Mallet	1	1	0
Cascago, J.	Fair View, Dinas Powis	1	0	0
Cave, Sir C., Bart.	Lidbury Manor, Sidmouth	1	0	0
Cave, C. H.	Rodway Hill House, Mangotsfield, Bristol	1	0	0
Cazalet, W. M.	Fairlawn, Tonbridge	1	0	0
Cecil, Lord A.	Mount Pleasant, Lymington	1	0	0
Chadwyck-Healey, C. E. H., C.B., K.C.	New Place, Porlock, Somerset	1	1	0

Name.	Residence.	Subscriptions. £ s. d.
†Chapman, C.	Carlecotes Hall, Dunford Bridge, Yorkshire	..
Chapman, W. W.	Mowbray House, Norfolk Street, Strand, London, W.C.	1 0 0
Chetwynd, G. J. B.	Wyndthorpe, near Doncaster	1 0 0
Chichester, C. Hamlyn	Bradiford House, Barnstaple, N. Devon	1 0 0
†Chick, J. H.	Wynford Eagle, Maiden Newton, Dorset	..
†Chick, W. D.	Compton Valence, Dorchester	..
Chick, W. J.	Stratton, Dorchester	1 0 0
Childs, C., M.D.	Boscarn, Looe, R.S.O., Cornwall	1 0 0
Christie, A. L.	Tapeley Park, Instow, N. Devon	1 1 0
Churchill, The Viscount, G.C.V.O.	Carlton Club, Pall Mall, London	1 0 0
†Churchward, F.	Hill House, Stoke Gabriel, near Totnes	..
*Clarendon, Earl of	The Grove, Watford	2 2 0
†Clark, J. J.	Goldstone Farm, Hove, Sussex, (Hon. Local Sec., 1885)	..
Clark, W. S.	Street, Glastonbury	1 0 0
Clayden, H.	Northoe, Park View, Hoddesdon	1 1 0
Clerk, Lieut.-Col. R. M.	Charlton House, Shepton Mallet	1 0 0
*Clifden, Viscount	Lanhydroc, Bodmin	2 0 0
*Clifford, Lord	Ugbrook, Chudleigh	2 2 0
Clinton, Lord	Heanton Satchville, Dolton, N. Devon	1 0 0
Clutton, R. W.	Hartswood, Reigate	1 0 0
†Coats, P.	Sheepcote, Clifford, Herefordshire	..
Cobb, H. M.	Higham, Rochester	1 0 0
Cobb R. H.	The Grove, Esher	1 1 0
Coleridge, Hon. G.	Holmans, Butleigh, Glastonbury	1 0 0
Coles, C.	Manor House, Winterbourne Stoke, Salisbury	1 0 0
Coles, H. Stratton	Guyers House, Corsham, Wilts	1 0 0
Collings, Right Hon. Jesse, M.P.	Edgbaston, Birmingham	1 0 0
Collins, C. R.	Hartwell House, Exeter	1 1 0
Collins, D.	Newton Ferrers, Carrington, Cornwall	1 0 0
Colman, Sir J., Bart.	Gatton Park, Surrey	1 0 0
*Colston, E.	Roundway Park, Devizes	2 2 0
Colthurst, Symons & Co., (Limited)	Bridgwater	1 0 0
Colville, H. K.	Loders Court, Bridport	1 0 0
Coney, Herbert F.	The Poplars, Pucklechurch, Bristol	1 0 0
Cook, R.	Crazelowman, Tiverton	1 0 0
Cooke, C. W. Radcliffe	Helens, Herefordshire, *via* Dymock, Glos.	1 0 0

Name.	Residence.	£	s.	d.
†Cookson, H. T.	Sturford Mead, Warminster	..		
Cooling, G. and Sons	Northgate Street, Bath	1	1	0
†Cooper, Sir R. P., Bart.,	Shenstone Court, Lichfield	..		
Cope, W.	Southerndown, Glam.	1	0	0
†Corbet, Sir W., Bart.	Acton Reynold, Shrewsbury	..		
Corbet, J. R.	More Place, Betchworth, Surrey	1	0	0
Corbet, Thomas	Perseverance Iron Works, Shrewsbury	1	0	0
Corbett E. W. M.	Bute Estate Office, Cardiff	1	0	0
Cordrey, W.	36, Southwark Street, London	1	0	0
†Cork and Orrery, The Earl of	22, Ryder Street, London, S.W.	..		
†Corner, H. W.	Manor House, Inglescombe, Bath	..		
†Cornwallis, F. S. W.	Linton Park, Maidstone	..		
Cory, Sir Clifford	Llantarnam Abbey, Mon.	1	0	0
Cory, Mrs. G. L.	11, Bentick Street, Manchester Square, London	1	0	0
Cossins, J.	Tarrant Rawston, Blandford	1	0	0
Cotgrave, H. F.	The Grange, Banwell, Somerset	1	0	0
†Cotterell, Sir J. R. G., Bart.	Garnons, Hereford	..		
Coultas, J.	Perseverance Iron Works, Grantham	1	0	0
†Courage, Raymond	Shenfield Place, Brentwood, Essex	..		
Courtis J. W., J.P.	City Hall, Fairwater Croft, Llandaff	1	0	0
†Coussmaker, Lt.-Col. G.	Westwood, Normandy, Guildford, Surrey	..		
*Coventry, The Earl of	Croome Court, Severn Stoke, Worcestershire	2	0	0
Cox, B.	Pwlpen Farm, Christchurch, Newport, Mon.	0	10	0
Crawshay, W. T.	Caversham Park, Reading	1	0	0
Crewdson, J. D.	Syde, near Cheltenham	1	0	0
Crewes, J. F.	9, Strangeways, Truro	1	1	0
Crick, Thomas	Great Ash, Winsford, Dulverton	0	10	0
Cridlan, J. J.	14, Bishop's Road, Bayswater, London, W.	1	0	0
Croft, Sir H. Archer	Lugwardine Court, Hereford	1	0	0
Croft, Col. J. H.	Devon and Exeter Club, Exeter	1	1	0
Crofts, D. J.	Sutton Montis, Sparkford, Bath	1	0	0
Crowley, J. & Co.	Meadow Hall Iron Works, Sheffield	1	0	0
Crutchley, P. E..	Limminghill Lodge, Ascot	1	0	0
Cuming, A. P.	Moreton Hampstead, Devon	1	0	0
Cundall, H. M., I.S.O., F.S.A.	Richmond, Surrey	1	0	0
Currie, L.	Minley Manor, Farnborough, Hants	1	0	0
Custance, Mrs. M.	Woodlands, Southwater, Horsham	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Dairy Supply Company (Ltd.)	Museum St., Bloomsbury, London	1	0	0
Damerel and Son	161, Sidwell Street, Exeter	1	0	0
Daniel, Rev. H. A.	Manor House, Stockland, Bridgwater	1	0	0
†Daniel, H. T.	Park House, Over Stowey, Bridgwater	..		
Daniel, Thos. C.	Stuckeridge, Bampton, North Devon	1	1	0
Darby, A. E. W.	Little Ness, Shrewsbury	1	0	0
Darby, E.	Liscombe, Dulverton	1	0	0
†Darell, D.	Hillfield House, Stoke Fleming, near Dartmouth	..		
*Darnley, Earl of	Cobham Hall, Kent.	2	2	0
†Davenport, Rev. Geo. H.	Foxley, Hereford	..		
Davie Sir W. A. F., Bart., C.B.	Creedy Park, Crediton	1	0	0
†Davey, J. Sydney	Brockym, Cury - Cross - Lanes, Cornwall	..		
Davey, Sleep, & Co.	Excelsior Plough Works, Plymouth	1	0	0
David, G. W.	Land Agent, Cardiff	1	0	0
Davies, H.	Shaftesbury Hotel, Newport, Mon.	1	0	0
Davies, W. H.	Claston, Dormington, Hereford	1	0	0
Davis Col.	Salt Hill House, near Slough	1	0	0
Davis, F. L.	7, Bute Crescent, Cardiff	1	1	0
†Davis, H. J.	Sutton Montis, Sparkford, S.O., Somerset	...		
Davis, Prof. J. R. Ainsworth, M.A.	Principal, Royal Agricultural College, Cirencester	1	0	0
†Davy, W.	Tracy Park, Bristol	..		
Daw, J. E.	Exeter	1	1	0
Dawson, W. and F.	Market Place, Bath	1	1	0
Day and Sons	Crewe	1	0	0
Day, John	Huxham, E. Pennard, Shepton Mallet	1	1	0
†Day, Son, and Hewitt	22, Dorset Street, Baker Street, London	..		
†Deacon, W. S.	Poynters, Cobham, Surrey	...		
Dean, S. E. & Sons	Dowsby Hall, Bourne, Lincs.	1	0	0
De Bertodano, B.	Cowbridge House, Malmesbury	1	0	0
De Blaquiere, Lord	3, The Circus, Bath	1	0	0
De Hamel, E.	Middleton Hall, Tamworth	1	0	0
De Hoz, M. A. M.	Westfield, Medmenham, Marlow	1	0	0
De Weyer, Col. Victor Bates Van	New Lodge, Winkfield, Windsor	1	1	0
Demuth, R. H.	Downrew, near Barnstaple	1	0	0
Dening, C. & Co.	Chard, Somerset	1	0	0

Name.	Residence.	£	s.	d.
Dennis, S. . . .	Latton, Cricklade, Wilts . .	1	0	0
Denny, G. A. . . .	Yarsop, Hereford . . .	1	0	0
De Rothschild Lady . .	Aston Clinton, Tring . . .	1	0	0
†Devas, H. G. . . .	Hartfield, Hayes, Kent . .		..	
Devon, The Earl of . .	Powderham Castle, Devon . .	1	0	0
*Devonshire, Duke of .	Chatsworth, Derbyshire . .	5	0	0
Dickinson, R. E. . .	Greenway Lane, Bath . . .	1	1	0
Dickinson, W. . . .	Kingweston, Somerton . .	1	1	0
Dickson and Robinson .	Cathedral Street, Manchester .	1	1	0
Dickson's, Limited . .	Chester	1	1	0
†Digby, Lord . . .	Minterne, Cerne Abbas . . .		..	
Digby, F. J. B. Wingfield .	Sherborne	1	0	0
Digby, G. H. . . .	Chalinnerington House, Cattistock, Dorchester . . .	1	0	0
†Divett, J. R. . . .	. . . .		..	
†Dobson, H. V. . . .	Perridge House, Shepton Mallet .		..	
Dodington, R. M. . .	. . . .	1	1	0
Dormer, Capt. C. W. C. .	Rousham, Oxford . . .	1	0	0
Drummond, F. D. W. .	Cawdor Estate Office, Carmarthen	1	0	0
Drummond, H. W. . .	5, Carlos Place, London, W. .	1	0	0
*Ducie, Earl of . . .	Tortworth Court, Falfield, R.S.O., Glos.	2	0	0
Dudding, H. . . .	Riby Grove, Stallingboro', Lincolnshire	1	0	0
Dugdale, J. M. . . .	Llwyn, Llanfyllin, near Oswestry	1	0	0
Duke, H. . . .	Clandon, Dorchester . . .	1	0	0
†Dunboyne, Lord . .	Greendale, Clyst St. Mary, Exeter .		..	
Duncombe, Capt. W. H. O.	Waresley Park, St. Neots . .	1	1	0
Dunlop, I. M. . . .	Avonhurst, Sneyd Park, Bristol .	1	0	0
*Dunraven, Earl of . .	Dunraven Castle, Bridgend, Glam.	2	2	0
*Dyke, Rt. Hon. Sir W. Hart, Bart. . . .	Lullingstone Castle, Eynsford .	2	2	0
Eagle Range and Foundry Company (Limited) .	Catherine Street, Aston, Birmingham	1	0	0
Eastwood, A. C. . .	Leigh Court, Taunton . . .	1	0	0
*†Eastwood, J. E. . .	Enton, Witley, Surrey . .		..	
Economic Fencing Company (Limited) . . .	Billiter House, Billiter Street, London, E.C.	1	0	0
Eden, R. H. H. . . .	Sherborne. Dorset . . .	1	0	0
†Edgcumbe, Sir Robert Pearce	4, Queen's Gate Gardens, London, S.W.		..	

Name.	Residence.	Subscriptions. £ s. d.
Edmonds, W.	Wiscombe Park, Colyton	1 0 0
†Edmondson, A.	Church Farm, Dry Sandford, Abingdon	..
Edridge, Sir. F., Bart.	Addiscombe Court, Croydon	1 1 0
Edwards, A. P.	Hutton, Weston-super-Mare	1 1 0
Edwards, C. L. Fry	The Court, Axbridge, Somerset	1 0 0
Edwards, W. H. G.	Butcombe Court, Wrington	1 0 0
Eldridge, Pope, & Co.	Dorchester	1 0 0
*Elliot, H. E. Tracy	9, St. James Terrace, Plymouth	2 2 0
Elliott, Sir Thomas H.	4, Whitehall Place, London, S. W.	1 1 0
*Elton, Sir E., Bart.	Clevedon Court, Clevedon	2 2 0
Emerson, W.	Sweldon Farm, Cardiff.	1 0 0
Enfield, Viscount	Dancer's Hill. Barnet	1 0 0
*England, E.	Parc, Llanishen	2 0 0
Ensor, T. & Son	Auctioneers, Dorchester	1 1 0
Esdaile, C. E. T.	Cothelstone House, Taunton	1 0 0
Ettinger, F. K.	Cotswold Sanatorium, near Stroud	1 0 0
Ettle, J., F.R.H.S.	1, Malvern View, Stanley Grove Road, Weston-super-Mare	1 1 0
Evans, H. M. Glynn	Plasissa, Llangenneth, Carmarthenshire	1 0 0
†Evan-Thomas, Commander A.	Caerwnon, Builth Wells, R.S.O.	..
†Eve, Mr. Justice	Pullabrook, Bovey Tracy, South Devon	..
Fardoe, M.	Woodram Farm, Pitminster, Taunton	1 0 0
†Farmer, S. W.	Little Bedwin, Wilts	..
†Farwell, E. W.	11, Laura Place, Bath	..
Farwell, Capt. W.	The Priory, Burnham, Bucks	1 0 0
†Farwell, Right Hon. Sir Geo.	15, Southwell Gardens, London, S.W.	..
Fellowes, Right Hon. A. E.	Honingham, Norfolk	1 0 0
Fennell, E. and Sons	11, High Street, Newport, Mon.	1 0 0
Fenton, A. D.	Maristow, Roborough, S. Devon	0 10 0
File C.	Elham, Canterbury	1 1 0
Finlay, Col. Alexander	Little Brickhill, Bletchley, Bucks	1 0 0
Fisher, The Right Rev. Bishop, D.D.	Burgh House, nr. Great Yarmouth, Norfolk	1 0 0
Fisher, Col. H. Oakdene	Ty Mynddi, Radyr, near Cardiff	1 0 0
*Fitzhardinge, Lord	Cranford House, Hounslow	2 0 0
Fletcher, C. E.	Kenward, Yalding, Maidstone	1 0 0
†Fletcher, Lionel J. W.	West Farleigh, Maidstone	..
Fletcher, W. J.	The Chantry, Wimborne	1 0 0
Flower, James	Chilmark, Salisbury	1 0 0

Name.	Residence.	£	s.	d.
Flower, Rev. Canon	15, Victoria Street, Dover	1	1	0
Flower, W. R.	West Stafford, Dorchester	1	0	0
Foot, J.	Woodlands, Dorchester	1	0	0
*†Forester, Capt. F. W.	Saxilbye Park, Melton Mowbray		..	
Forestier-Walker, I. A.	The Wylands, Shirehampton, Bristol	1	0	0
Foster-Harter, G. L.	Salperton Park, Haselton, R.S.O., Glos.	1	0	0
Foster, W.	Mel Valley, Wake Green Road, Moseley	1	0	0
Fowler & de la Perrelle	Porter's Lane, Southampton	1	0	0
†Fowler, G.	Claremont, Taunton		..	
Fowler, J.	Aston House, Avening, Stroud	1	0	0
Fowler, J., & Co. (Ltd.)	Leeds	1	0	0
Fowler, W. H.	Claremont, Taunton	1	0	0
Fownes, Col.	Manor House, Weston Bampfylde, Sparkford, Bath	1	0	0
Fownes, Mrs.	Manor House, Weston Bampfylde, Sparkford, Bath	1	0	0
Fox, Mrs. A.	Brislington House, near Bristol	1	0	0
Fox, Dr. A. E. W.	Ennox Lodge, Hinton Charterhouse	1	1	0
Fox Brothers & Co.	Wellington, Somerset	1	1	0
Fox, C. L.	Rumwell Hall, Taunton	1	0	0
†Fox, Robert	Grove Hill, Falmouth		..	
Foxcroft, C. T.	Hinton Charterhouse, Bath	1	1	0
Foxcroft, E. T. D.	Hinton Charterhouse, Bath	1	1	0
†Franklen, Col. C. R.	Clemenstone, Bridgend		..	
Frayne, James	Pipers Pool, Egloskerry, R.S.O., Cornwall	0	10	0
Frayn, John	St. Stephens, Launceston	1	0	0
Fricker, J. A.	Suddon Grange, Wincanton	1	0	0
Frost, Adam E.	Kemys, 53, Caerān Road, Newport, Mon.	1	0	0
Fry, H. A.	19, Monmouth Place, Bath	1	0	0
*Fry, J. F.	Ford Abbey, Chard	2	0	0
*Fry, J. S. & Sons (Ld.)	Union Street, Bristol	2	2	0
Fuller, E. R.	Bathford, Bath	1	1	0
†Fuller, G. Pargiter	Neston Park, Corsham		..	
*Fuller, J. M., M.P.	Neston Park, Corsham	2	0	0
Fuller, S. and A.	Bath	1	0	0
Fursdon, Charles	Fursdon, Thorverton, Exeter	1	0	0
Fursdon, E. S.	Bellenden, Exeter	1	1	0
Fyson & Co., Limited	Union Street, Bath	1	1	0

Name.	Residence.	Sub- scriptions. £	s.	d.
†Galloway, W. G.	Cridland Farm, Spaxton, Bridgwater	..		
Gane, P. J.	Estate Office, Pickwick, Corsham, Wilts	1	0	0
Gardiner, Sons & Co.	Nelson Street, Bristol	1	1	0
Garne, W.	Aldsworth, Northleach	1	1	0
Garne, W. T.	Aldsworth, Northleach	1	1	0
*Garratt, Lt.-Col. T. A. T.	Bishop's Court, Exeter	2	2	0
Garraway, W. A.	Durdham Down Nurseries, Bristol	1	0	0
Garrett, W.	Backwell Hill House, West Town, R.S.O., Somerset	1	0	0
Garton, Jas.	Clarendon Park, Salisbury	1	0	0
Garton, T. R.	Warrington	1	0	0
Gear, W. H.	Bridge Street, Bath	1	1	0
*†George, William E., J.P.	Downside, Stoke Bishop, Bristol	..		
Gerrish, J.	Chipping Sodbury	1	0	0
†Gibbons, B. G.	Sheephouse Farm, Camerton, Bath	..		
Gibbons George.	Tunley Farm, near Bath	1	0	0
†Gibbons, H.	Church Farm, Clutton, Bristol	..		
Gibbons, P., J.P.	Keynsham	1	1	0
Gibbons, T.	Glenfelin, Neath	1	0	0
Gibbs, A. H.	Pytte, Clyst St. George, Topsham, Devon	1	0	0
*†Gibbs G. A., M.P.	Tyntesfield, Bristol	..		
†Gibbs, H. M.	Barrow Court, Flax Bourton, R.S.O. Somerset	..		
Gibson, J. T.	The Studio, Shrapscombe, nr. Stroud	1	0	0
Gilbert C. D.	The Manor House, Eastbourne, Sussex	1	1	0
Gilbert, F. W. (Ld.)	Swarkestone, Derby	1	0	0
Gilbey, Sir W., Bart.	Cambridge House, Regent's Park, London	1	1	0
Gill, P. O.	Uplands, Wrington, Somerset	1	0	0
Gillingham, J. and Son	Prospect House, Chard	1	0	0
†Gladstone, J.	Bowden Park, Chippenham	..		
Glantawe, Lord	The Grange, Swansea	1	0	0
Glyn, R. F.	The Cross House, Fontnell Magna, Shaftesbury	1	0	0
*Glyn, Sir Richard G., Bart.	Gaunt's House, Wimborne	2	2	0
†Godman, C. B.	Woldringfold, Horsham	..		
Godman, J.	The Raswell, Hascombe, Godalming	1	0	0
†Goldney, Sir Prior, Bart., C.B.	Derriads, Chippenham	..		
Gooch, G. P.	South Villa, Campden Hill Road, London, W.	1	0	0
Goodden, J. R. P.	Compton House, Sherborne	1	0	0
Goodman, Sons, Pollard and Bruford	3, Hammet Street, Taunton, and Broad Street House, London, E.C.	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Gordon, G. H.	The Barn House, Sherborne	1	0	0
Gore-Langton, Hon. H. P.	Hatch Park, Taunton	1	0	0
Goring, C.	Wiston Park, Steyning	1	0	0
†Gorringe, Hugh	Kingston-by-Sea, Brighton		..	
Gotto C. L.	Passaford, Hatherleigh, N. Devon	1	1	0
Grace A.	39, Welsh Back, Bristol	1	0	0
Grant, C. E.	Bursar, King's College, Cambridge	1	0	0
Grant, W. J.	Pentonville, Newport, Mon.	1	0	0
Greaves, R. M.	Wern, Portmadoc, North Wales	1	0	0
†Greenall, Mrs. C. E.	Willoughby Hall, Grantham		..	
†Greenall, Sir G., Bart.	Walton Hall, Warrington		..	
Greenham, W. N.	Overton, West Monkton, Taunton	1	1	0
Green-Price, Sir R. D., Bart.	The Grove, Presteign, Radnorshire	1	0	0
Greenslade, W. R. J.	Fairfield, Trull, Taunton	1	0	0
Greenway, W.	Halse, Taunton	1	0	0
Greenwell, Sir W., Bart.	Marden Park, Woldingham, Surrey	1	0	0
Gregory, W.	Wellington, Somerset	1	0	0
†Guest, Lady Theodore	Inwood, Templecombe.		..	
Guille, H. C. de Stevens	St. George, Castel, Guernsey	1	0	0
Guise, Sir W. F., Bart.	Elmore Court, Gloucester	1	0	0
Guyon, Rev. H. C.	The Rectory, Lamyat, Bath	1	0	0
Habgood, G.	Harley Lodge, Wimborne	1	0	0
Hall, Crabtree and Heap	25, Price Street, Birkenhead	1	0	0
†Hambro, Sir Everard A.	Hayes Place, Beckenham, Kent		..	
Hambro, H. C.	70, Old Broad Street, London, E.C.	1	1	0
Hancock, C. R.	The Ashlands, Warmley, near Bristol	1	0	0
Hancock, C. L.	Manor House, Cothelstone, Taunton	1	1	0
Hancock, Rev. Prebendary	The Priory, Dunster, Somerset	1	0	0
Hancock, H. C.	The Court, Milverton, Taunton	1	0	0
Hancock, P. F.	Culverhead, Wiveliscombe	1	0	0
Hancock, R. D.	Halse, Taunton	1	0	0
Hannam, T.	Westgate Hotel, Newport, Mon.	1	0	0
Harbottle, E.	Topsham	1	0	0
Harding, C.	Upton Grove, Tetbury	1	0	0
Harding, T. K.	Ashton Gifford House, Codford, Bath	1	0	0
Harding, R.	Fenswood Farm, Long Ashton, Bristol	1	0	0
Hardwick, E. A.	Kewstoke, Weston-super-Mare	1	0	0
Harris, A.	Brounsell Farm, Stourton Caundle, Stalbridge	1	0	0
Harris, G. Hardy	Woodway, Teignmouth	1	0	0

Name.	Residence.	Sub-scriptions. £	s.	d.
Harris, Dr. Rutherfoord	Llangibby Court, Newport, Mon.	1	0	0
Harrison, G.	Gainford Hall, Darlington	1	0	0
Harrison, Miss	West Hay, Wrington	1	0	0
Harrison, McGregor & Co.	Leigh, Lancashire	1	0	0
Hatzfeldt, H.S.H. Prince	Draycott, Chippenham	1	1	0
Haversham, Lord	Trevina, Tintagel, Cornwall	1	0	0
Hawkins, Mrs.	10, Portland Place, London, W.	1	1	0
†Haydon, Lt.-Col. W. H.	Maidford, Malmesbury, Wilts		..	
Hayes, F. J.	West Pennard, Glastonbury	1	0	0
*Heathcoat-Amory, Sir J. H., Bart.	Knightshayes Court, Tiverton, Devon	2	2	0
Heathcoat-Amory, I. M.	Hensleigh, Tiverton, Devon	1	0	0
Heberden, W. B., C.B.	Elmfield, Exeter	1	0	0
†Henderson A. N.	Street Ashton House, Lutterworth		..	
Henderson, Sir A., Bart.	Buscot Park, Faringdon, Berks	1	1	0
*†Henderson, W.	Berkeley House, Frome		..	
Henriques, Col. E. N.	Ambarrow Hill Dairy Farm, Sandhurst, Berks	1	0	0
Henry, Lt.-Col. F.	Elmstree, Tetbury	1	0	0
Herbert, Maj.-Gen. Sir Ivor, Bart., M.P.	Llanarth Court, Raglan, Mon.	1	0	0
Hesse, F. W.	Yeomans, Wrington, East Somerset	1	0	0
Hicks, Mrs. R.	Treganhoe, Newbridge, R.S.O., Cornwall	1	0	0
Hill, Edward	Stratton House, Evercreech	1	0	0
†Hill, B. H.	Newcombes, Crediton, Devon		..	
Hill, V. T.	Cardu House, Cyntwell, Glam.	1	1	0
Hippisley & Sons	Wells, Somerset	1	0	0
Hippisley, R. J. B.	Ston Easton Park, Bath	1	0	0
Hiscock, A., jun.	Manor Farm, Motcombe, Shaftesbury, Dorset	1	0	0
Hiscock, E.	Ashley Farm, Marnhull, Dorset	1	0	0
†Hoare, Sir H. H. A., Bart.	Stourhead, Bruton		..	
Hobbs, J. T.	Maisey Hampton, Fairford	1	0	0
Hobbs, R. W.	Kelmscott, Lechlade	1	0	0
Hobhouse, Rt. Hon. C. E., M.P.	The Ridge, Corsham, Wilts	1	0	0
*Hobhouse, Rt. Hon. H.	Hadspen House, Castle Cary	2	0	0
Hoddinott, S.	Worminster Farm, Shepton Mallet	1	0	0
Holland and Coombs	Bristol	1	0	0
Hollond, J. R.	Wonham, Bampton, Devon	1	0	0
Holman, F. A.	Dunley Manor, near Whitchurch, Hants	1	0	0
Holt Needham, O. N.	Barton Court, Colwall, near Malvern	1	0	0
*Homelight Oil Co.	Gordon Chambers, Queen Street, Cardiff	2	2	0
Hood, Sir A. Acland, Bart., M.P.	St. Audries, Bridgwater	1	1	0

Name.	Residence.	Subscriptions. £	s.	d.
†Hooper, R. N. . . .	Stanshawes Court, Chipping Sodbury	..		
†Hope, W. H. B. . .	Eastwood, East Harptree, Bristol .	..		
Hopkin, Morgan . .	Swansea	1	0	0
Hopper, H. R. . . .	Merryweather & Sons, Greenwich Road, London, S.E. . . .	1	1	0
Horlick, J., D.L. . .	Cowley Manor, Cheltenham . .	1	0	0
†Horner, Sir J. F. Fortescue	Mells Park, Frome . . .	..		
Hornsby and Sons (Ltd.) .	Grantham, Lincoln . . .	1	0	0
Horton, Rev. Le G. . .	Wellow Vicarage, Bath . .	1	1	0
Hosegood, A. W. . .	Williton, Taunton . . .	1	0	0
Hosegood, Obed., jun. .	Dillington, Ilminster . . .	0	10	0
Hosken, W. J.	Pulsack, Hayle, Cornwall . .	1	0	0
Hoskins, R. J. . . .	Beard Hill Farm, Shepton Mallet .	1	0	0
Hoskyns, H. W. P. . .	North Perrott Manor, Crewkerne, Somerset	1	0	0
Houldsworth, A. F. . .	Widcombe, Kingsbridge, Devon .	1	1	0
Houlton, W. . . .	Broadfield Farm, Northleach, R.S.O.	1	0	0
Hounsell, J. M. . . .	Wraxall Manor Farm, Cattistock, Dorset	1	0	0
Howard, J. and F. . .	Britannia Works, Bedford . .	1	0	0
Hudson, E. V. . . .	Wolseley Works, Witton, Birmingham	1	0	0
†Hughes, A. E. . . .	Wintercott, Leominster . .	..		
Hughes-Gibb, F. . .	Manor House, Tarrant Gunville, Blandford	1	0	0
Hull, R.	Sutton Benger, Chippenham .	1	0	0
Humphries, Sidney . .	Eastfield Lodge, Westbury-on-Trym, Bristol	1	1	0
Hunt, Col. H. S.. . .	St. George's Hill, Bathampton, Bath	1	0	0
Hunter, Sir Charles, Bart., M.P.	Babbington House, Frome . .	1	0	0
Hunter, J. . . .	Seed Merchant, Chester . .	1	0	0
†Hurle, J. C. . . .	Brislington Hill, Bristol . .	..		
Hurst and Son . . .	152, Houndsditch, London . .	1	0	0
Hussey, J. W. . . .	Bouverie House, Exeter . .	1	0	0
†Hylton, Lord . . .	Charlton, near Radstock . .	..		
Ibbotson, R. . . .	The Hawthorns, Knowle, Warwickshire	1	0	0
*Ilchester, Earl of . .	Melbury, Dorchester . . .	2	2	0
Imbert-Terry, H. M. . .	Strete Raleigh, Whimple . .	1	0	0
Inglis, J. C. . . .	General Manager, Great Western Rly., Paddington, London, W. .	1	0	0
Innes, G. P. Mitchell . .	Craig-yr-Haul, Castleton, Cardiff .	1	0	0

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Irby, Lieut.-Col. F. A. .	Boyland Hall, Norfolk . .	1	0	0
*Irby, Hon. G. N. . .	Porthamel, Llanfair, P.G., Anglesey	2	0	0
Irby, Capt. L. P. . .	Brook House, Eastry, Kent . .	1	0	0
Ireland, A. C. . . .	Brislington Hall, near Bristol .	1	1	0
Irvine, H. O. . . .	Southerndown, Bridgend, Glam. .	1	0	0
Jackson, Sir H. M., Bart. .	Llantillio Court, Abergavenny .	1	0	0
James R. H. and Sons .	8, Queen Square, Bristol . .	1	0	0
Jardine, E. . . .	The Park, Nottingham. . .	1	1	0
Jarmain, T. M. . . .	Haseley Iron Works, Tetsworth .	1	0	0
Jefferis, Mrs. . . .	Royal Refreshment Rooms, Bristol	1	0	0
Jefferson, J. . . .	Peel Hall, Chester . . .	1	0	0
Jenkin, S. W. . . .	Liskeard, Cornwall . . .	0	10	0
Jenkins, D. . . .	Hemingstone Court, Cowbridge, Glam.	1	0	0
Jenkins, W. H. P. . .	Frenchay Park, Bristol . .	1	0	0
*Jersey, Earl of . . .	Middleton Park, Bicester, Oxon. .	2	0	0
Jervoise, F. H. T. . .	Herriard Park, Basingstoke . .	1	1	0
Jeyes' Sanitary Compounds Company . .	Cannon Street, London, E.C. .	1	0	0
John, E. . . .	Cowbridge, Glamorgan . .	1	0	0
Joicey, J. . . .	Poulton Priory, Fairford, Glos. .	1	0	0
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†Jonas, George . . .	Old Vicarage, Duxford, Cambs. .		..	
Jones, W. . . .	Pencisely, near Cardiff . .	1	0	0
Keel, W. W. . . .	Stanton Drew, Somerset . .	1	0	0
Keene, James B. & Co. .	*Journal* Office, Bath . . .	1	0	0
Kell & Co. . . .	Gloucester	1	0	0
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Kemble, C. A. . . .	Hallatrow, Bristol . . .	1	0	0
†Kemp, L. J. . . .	Maer, Exmouth		..	
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Name.	Residence.	Subscriptions. £ s. d.
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King and Son, R. . .	Milsom Street, Bath . . .	1 1 0
King, W. E. M. . . .	Donhead Lodge, Salisbury . .	1 0 0
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*Lethbridge, Sir Wroth P. C., Bart. . . .	Sandhill Park, near Taunton .	2 0 0
*Lethbridge, W. . .	Wood, Okehampton . . .	2 0 0
Leverton, W. A. . .	Columb John Farm, Stoke Canon, Exeter	1 0 0
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†Leyland, C. J.	Haggerston Castle, Beal, Northumberland	..		
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Lipscomb, Godfrey	Margam Park, Port Talbot	1	0	0
†Lister, J. J.	Warninglid Grange, Haywards Heath	..		
Lister, R. A., & Co.	Dursley, Gloucestershire	1	1	0
†Llangattock, Lord	The Hendre, Monmouth	..		
Llewellyn, Col. Evan H.	The Court Farm, Langford, Bristol	1	1	0
Llewellyn, Llewellyn T. E.	Nanceglos, Hea Moor, R.S.O., Cornwall	1	1	0
*Llewelyn, Sir J. T. D., Bart.	Penllergare, Swansea	2	2	0
*Lloyd, Herbert	Plas Cilybebyll, Pontardawe, R.S.O., Glam.	2	2	0
*†Long, Rt. Hon. Walter H., M.P.	Rood Ashton, Trowbridge	..		
Long, Col. William	Woodlands, Congresbury, Somerset	1	0	0
Longman, R.	Wraxall, Evercreech, Bath	1	0	0
Lopes, Sir H. Y. Buller, Bart.	Maristow, Roborough, Devon	1	0	0
Loram Brothers	Cathedral Dairy, Exeter	1	1	0
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Ludlow, Lord	Lamport, Northampton	1	1	0
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Luttrell, Capt. A. F.	Court House, East Quantoxhead, Bridgwater	1	0	0
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McCalmont D. H. B.	Crockford's Farm, Newmarket	1	0	0
McIntosh, Mrs. C. M.	Havering Park, Havering Atte Bower, Essex	1	1	0
Maclean, Donald	46, Lincoln's Inn Fields, London, W.C.	1	0	0
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†Mansell, A. E.	Mount Vernon, Melton Mowbray, Tasmania	..		
Marcus M.	High Trees, Redhill, Surrey	1	0	0
Marden, H.	Ashwick, Dulverton	1	1	0
Marfell, R. H.	Great House Farm, Llangeview, Usk	1	0	0
Marken, E. R.	Henstaff Court, Pontyclun, R.S.O.	1	1	0
Marker, Richard	Combe, near Honiton	1	0	0
Marriner, C. F.	Thorpe Hall, Haskiton, Woodbridge, Suffolk	1	0	0
Marshall, L. H.	Chippenham	1	0	0
Marshall, Sons & Co.	Britannia Iron Works, Gainsboro'	1	0	0
Martin, E. G. Bromley	Ham Court, Upton-on-Severn	1	0	0
Martin, J.	Thorverton, R.S.O., Devon	1	0	0
Martin and Carnes	Taunton	1	0	0
Martyn, G.	Trewidden, Liskeard, Cornwall	1	1	0
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Massey-Harris Co. (Ltd.), (C. W. Dawkins, manager)	54 & 55, Bunhill Row, London, E.C.	1	0	0
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Mathews, Ernest	Little Shardeloes, Amersham, Bucks	1	0	0
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Matthews, L. B.	Milton, Gillingham, Dorset	1	0	0
Maule, M. St. John	Chapel House, Bath	1	0	0
May, A. C.	Avon House, Stoke Bishop, Bristol	1	0	0
Maynard, W. T.	Yeovil	1	0	0
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†Mayo, John	Coker's Frome, Dorchester	..		
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Meager, F. F.	Melbourne House, Swansea	1	0	0
Meddick, William G.	11, Great Stanhope Street, Bath	1	0	0
Medlycott H. M.	Milborne Port, Somerset	1	0	0
Merry, Richard	Goulds, Broadclyst, Exeter	0	10	0
Merry, W. F.	Ash Clyst, Broadclyst, Exeter	1	0	0
Merryweather, J. C.	4, Whitehall Court, London, S.W.	1	0	0
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*Michaelis. M.	Tandridge Court, Oxted, Surrey	2	2	0
Michie, D.	Tichborne Park Estate Office, Alresford, Hants	1	0	0

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Millbank, Sir Powlett C. J., Bart.	Norton Manor, Priesteign	1 0 0
Miller, T. H.	Clan Villa, Bathwick Hill, Bath	1 0 0
Miller-Hallett, A.	Goddington, Chelsfield, Kent	1 1 0
Mills, B. W.	31, Cambridge Place, Paddington, London, W.	1 0 0
Milsom, C. and Son	9, Fleet Street, Swindon	1 1 0
Minton, T. S.	Montford, Shropshire, R.S.O.	1 0 0
Mitchell, A. C.	Highgrove, Tetbury	1 0 0
†Mitchell, F. J.	Llanfreckva Grange, Caerleon, Mon.	..
Molassine Co.	East Greenwich, London, S.E.	1 0 0
Montefiore, Mrs.	Worth Park, Crawley, Sussex	1 1 0
Montgomery, H. G.	2, Edinburgh Mansions, Victoria Street, London, S.W.	1 1 0
Moody, C.	Maismoor, Evercreech	1 0 0
Moore-Gwyn, J. E.	Dyffryn, Neath, Glamorgan	1 0 0
†Moore, H. F.	42, Angell Road, Brixton, London, S.W.	..
Moore, W. and Son	9 and 10, Monmouth Street, Bath	1 0 0
Moore-Stevens, Col. R. A.	The Cross, Torrington, Devon	1 0 0
Morant, E. J.	Brockenhurst Park, Hants	1 0 0
Morel, C. E.	The Lindens, Penarth, Cardiff	1 0 0
*Moreton, Lord	Sarsden Lodge, Chipping Norton	2 2 0
Morgan, Lewis	Cathedral Road, Cardiff	1 1 0
Morgan, T. S.	Whimple House, Whimple, Exeter	1 0 0
Morgan, W. A.	St. Leonards Lodge, St. Andrews, Fife	1 1 0
Morgan-Richardson, C.	Morgenan, Rhoshill, R.S.O.	1 0 0
*Morley, Earl of	Saltram, Plympton, Devon	2 0 0
Morley, Charles	Shockerwick, Bath	1 1 0
*Morris, C.	Highfield Hall, St. Albans	2 0 0
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Morris, Sir R. A., Bart.	Sketty Park, Swansea	1 0 0
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Morse, L. L.	The Croft, Swindon	1 0 0
*Mount-Edgcumbe, Earl of	Mount Edgcumbe, Devonport	2 2 0
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Name.	Residence.	Subscriptions. £	s.	d.
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Neagle, D. T.	London, Glos. and N. Hants Dairy Company, Clifton, Bristol	1	0	0
Neal, J. F.	Kingsdon, Taunton	1	0	0
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†Neville-Grenville, Robert	Butleigh Court, Glastonbury		..	
New H. G.	Craddock, Cullompton, Devon	1	0	0
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Nichols, G.	49, Broad Street, Bristol	1	0	0
Nickisson, J. L.	Hinton Manor, Swindon	1	0	0
Nix, J.	Tilgate, Crawley, Sussex	1	1	0
Nock, E.	Brockton House, Shifnal, Salop	1	0	0
Nock, R. B.	48, Queen St., Wolverhampton	1	0	0
Norman, H. T.	Cushuish, Kingston, Taunton	1	0	0
*Normanton, Earl of	Somerley, Ringwood	2	0	0
Norrish, Thomas	. . . .	0	10	0
North, G. F.	Stratfield Saye, Mortimer, R.S.O., Berks.	1	0	0
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*Northumberland, Duke of	Albury Park, Guildford	5	0	0
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Osmond and Son	Spalding	1	0	0
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*Paget, Sir A., Bart.	9, King's Bench Walk, Temple, London	2	0	0
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Parker, F. J. . . .	Plymouth Street, Swansea . .	1	0	0
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Parkin, P. W.	. . . .	1	0	0
Parmiter, P. J. & Co. .	Tisbury, Wilts	1	0	0
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Parry Okeden, Lieut.-Col. U. E. P. . . .	Turnworth, Blandford . . .	1	0	0
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†Parsons, R. M. P. . .	Misterton, Crewkerne, Somerset .	..		
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Peake-Mason, W. J. . .	The Manor House, Trent, Sherborne	1	0	0
Pearse, T. C. . . .	Leigh Farm, Dulverton . .	1	0	0
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*Pembroke, Earl of . .	Wilton House, Salisbury . .	2	0	0
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Pendarves, W. Cole . .	Pendarves, Camborne, Cornwall .	1	1	0
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†Pettifer, T. Valentine, F.R.C.V.S. . . .	The Limes, Tetbury, Gloucester .	..		
†Phillips, C. D. . . .	The Gaer, Newport, Monmouth .	..		
Phillips, F. . . .	Nantcoch, Newport, Mon. . .	1	1	0
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Phipps, C. N. P.. . .	Chalcot, Westbury, Wilts . .	1	1	0
Piggott Brothers & Co. .	59, Bishopsgate Street Without, London, E. C.	1	0	0
Pike, C. A. . . .	Permanent Nitrate Committee, Friar's House, 39-41, New Broad Street, London, E.C. . .	1	0	0
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Name.	Residence.	Subscriptions. £	s.	d.
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Poole, Mrs. A. R.	King's Hill, Dursley	1	1	0
Pope, Alfred	Dorchester	1	0	0
Pope, A. R.	Culliford House, Dorchester	1	0	0
Pope, John	Nowers, Wellington, Somerset	1	0	0
Pope, S. P.	Kelton, Exmouth	1	1	0
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Portman, Hon. Mrs. C. B.	Goldicote, Stratford-on-Avon	1	0	0
†Portman, Hon. E. W. B.	Hestercombe, Taunton		..	
*Portman, Viscount	Bryanston, Blandford	5	0	0
*Poynder, Sir J. Dickson, Bart.	Hartham Park, Corsham	2	0	0
Price, Owen	Nantyrharn, Cray, Brecon	1	0	0
Prichard, H. L.	Penmaen, R.S.O., Glam.	1	0	0
Pritchard, D. F., J.P.	Crumlin Hall, Crumlin, Mon.	1	1	0
Proctor, H. and T.	Cathay, Bristol	1	1	0
Puddicombe, W.	29, Walters Road, Swansea	1	0	0
Pullen, W. B.	The Ton, Tredunnock, near Newport, Mon.	1	0	0
†Purgold, A. D.	Ebnal Lodge, Gobowen, Salop		..	
*†Radnor, Earl of	Longford Castle, Salisbury		..	
†Ransome, B. C.	Orwell Works, Ipswich		..	
Ransome, E. C.	Orwell Works, Ipswich	1	0	0
Rawlence, Ernest A.	Newlands, Salisbury	1	0	0
Read, B.	Church Farm, Cam, Dursley, Gloucester	1	0	0
Rees, D.	Brynbedw, Tylorstown, Glam.	1	1	0
Rees, W. J.	Laurels, Swansea	1	1	0
Reeves, Robert and John, and Son	Bratton Iron Works, Westbury, Wilts	1	0	0
Rhoades, W. W.	Alnwick Castle Estate Office, Bailiff Gate, Alnwick	1	0	0
Rice H. E. H.	Dene Court, Dover	1	0	0
Richardson, Rev. A.	Combe Down Vicarage, Bath	1	0	0
Roberts, J. D. Cramer	Thornton, Frant, Sussex	1	1	0
Robins, J.	High Bray, South Molton	0	10	0

Name.	Residence.	Subscriptions. £	s.	d.
Robins, T.	Gratton Barton, High Bray, South Molton	1	0	0
Robinson, J.	Rings Hill Farm, Borstal, Rochester	1	1	0
Robinson, E. S. & A. (Ltd.)	Redcliffe Street, Bristol	1	1	0
Robinson G. & Co.	137, Fenchurch Street, London, E.C.	1	0	0
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Rogers, E. P.	Burncoose. Perranwell. Cornwall	1	0	0
Rogers W.	Court Lodge, Horton Kirby, Kent	1	0	0
Rogerson, R. W.	Ward and Co., Northgate Street, Bath	1	0	0
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Rossiter, James	West Town, R.S.O., near Bristol	1	0	0
Rothschild, Lord	Tring Park, Herts	1	0	0
Rouse-Boughton, Sir. W. St. A., Bart.	Downton Hall, Ludlow	1	0	0
Rouse Boughton, Lady	Downton Hall, Ludlow	1	0	0
Rout, F. R.	Banham, Attleborough, Norfolk	1	0	0
Rowe, F. W.	Trevego, Lostwithiel, Cornwall	1	0	0
Rowliffe, E. L.	Hall Place, Cranleigh, Guildford	1	1	0
Royal Guernsey Agricultural and Horticultural Society	Guernsey	1	0	0
Ruston, Proctor & Co.	Lincoln	1	0	0
Rutherford, J. A.	Highclere Estate Office, Newbury, Berks	1	0	0
Saillard, P.	Buchan Hill, Crawley, Sussex	1	0	0
St. Aubyn, Col. E.	Glyn, Bodmin Road, Cornwall	1	0	0
*Saint Germans, Earl of	Port Elliot, St. Germans, R.S.O., Cornwall	3	3	0
†Salmon, H. C.	North Fields, Bridgwater		..	
Salmon, W.	Yonder Broadpool Farm, Doulting, Shepton Mallet	1	0	0
Salomons, L.	Norbury Park, Dorking, Surrey	1	0	0
Salter, Benjamin	Newlands, Broadclyst, Exeter	1	0	0
Salter, T.	Beare Farm, Broadclyst, Exeter	1	0	0
Samuelson, Ernest	Bodicote Grange, Banbury	1	1	0
Sanders, R. A.	Court, Exford, Taunton	1	0	0
Sanford, Col. E. C. A., C.M.G.	Nynehead, Wellington, Somerset	1	0	0
Sanford, H. S. J. A.	The Court House, Middlehill, Broadway, Worcestershire	1	0	0
Sankey, R. J.	Queen Anne's Mansions, St. James's Park, London, S.W.	1	0	0
Scobell, Col. Barton L. J.	Kingwell Hall, High Littleton, near Bristol	1	1	0

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†Scott, T.	Ditton Court, Maidstone	..
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†Sherston, T. P. D.	. . . .	..
Shore, J. H.	Whatley House, Frome	1 0 0
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Simonds, L. de L.	Audley's Wood, Basingstoke	1 1 0
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Simpson, F. C.	Maypool, Churston Ferrars, R.S.O., S. Devon	1 0 0
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*†Singer, A. M.	Hove, Sussex	..
*Singer, W. M. G.	Streatfield, Paignton, Devon	2 0 0
Skinner, G. C.	Pound, Bishops Lydeard	1 0 0
Skrine, Col. H. M.	Warleigh Manor, Bath	1 1 0
Slatter J.	Paxford, Campden, S.O., Glos.	1 0 0
Smail, J. F.	Warren Wood, Hayes, Kent	1 1 0
Smart, G. E.	Combe Hay Manor, Bath	1 1 0
Smith, A. J.	Brooklea, St. Anne's Park, Bristol	1 0 0
Smith, Hugh C.	Mount Clare, Roehampton	1 0 0
Smith, H. S.	Eton Villa, Fishponds, Bristol	1 0 0
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†Smith, J. W.	Thinghill Court, Hereford	..
Smith, Hon. Mrs. Murray	Gumley Hall, Market Harborough	1 0 0
†Smith, S. Lee	Larkfield, Maidstone	..
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*Smyth, Lady	Ashton Court, Bristol	2 2 0
Smyth, P.	Broford, Dulverton	1 0 0
Smyth-Osbourne, J. S.	Ash, Iddesleigh, N. Devon	1 0 0
Smyth-Richards G. C.	Filleigh Lodge, South Molton	1 0 0
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*Somerset, Duke of	Maiden Bradley, Bath	2 0 0
Somerset Trading Co.	Bridgwater	1 1 0
†Somerville, A. F.	Dinder House, Wells, Somerset	..

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Spencer, W. C.	North Perrott, Crewkerne	1	0	0
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Starkey, T.	Woodville, Ilfracombe	1	0	0
Stenhouse, V.	Courtlands, Taunton	1	1	0
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Stepney, Sir A. C., Bart.	The Dell, Llanelly	1	1	0
Stevens, R. N.	Woodham Hall, Woking, Surrey	1	0	0
Stevens, W.	Budlake, Broadclyst, Exeter	1	0	0
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Tapp, J. A.	Knaplock, Dulverton	1	0	0
Tate, J. A.	Fairfield, Wells, Somerset	1	0	0
Tatem, W. J.	The Court, St. Fagan's, Glam.	1	0	0
Tavener, G. E.	Budlake, Devon	1	0	0
Tayleur, C. W.	Hampton, St. Mary Church, Torquay	1	0	0
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Taylor, H. W.	Showle Court, Ledbury, Hereford	1	0	0
†Tazewell, W. H.	Manor House, Taunton		..	
*Temple, Earl	Newton St. Loe, Bath	2	0	0
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Thomas, Sir Griffith	Court Herbert, Neath	1	0	0
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Thomas, J. C.	Hatch Beauchamp, Taunton	1	0	0
Thomas, T. P.	Merevale, Dinas Powis	1	0	0
Thomas, W. Jones	Highmead, Barry	1	1	0
Thompson, J. W. H.	115, St. James's Court, London, S.W.	1	1	0
Thomson, Sir R. White	Broomfield Manor, Exbourne, N. Devon	1	0	0
Thorley, J.	Oakhill, High Barnet	1	0	0
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Titt, J. W.	Implement Maker, Warminster	1	0	0
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Torr, E. R. Berry	Instow, N. Devon	1	0	0
Tory, H. J. S	Damory Court, Blandford	1	0	0
Trafford, G. R.	Hill Court, Ross, Herefordshire	1	1	0
*Tredegar, Viscount	Tredegar Park, Newport, Mon.	2	2	0
Treffry, I. de C.	Penarwyn, Par Station	1	1	0
Trefusis, Col. The Hon. J. S.	Hawkmoor, Bovey Tracy, Devon	1	0	0
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Tremaine, W. H.	Sherborne, Northleach, Cheltenham	1	0	0
Tremayne, Capt. W. F.	Carclews, Perran ar Warthal, Truro	1	1	0
Tremayne, Hon. Mrs.	Sydenham, Lewdown, R.S.O., N. Devon	1	0	0
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Trevilian, E. B. Cely	Port Town, Taunton	1	0	0
Treweeke, W. H.	Ryne Hill, Kingham, Chipping Norton	1	0	0
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Name.	Residence.	Sub-scriptions. £	s.	d.
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Wright, F. . . .	112, High Street, Cheltenham .	1	0	0

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